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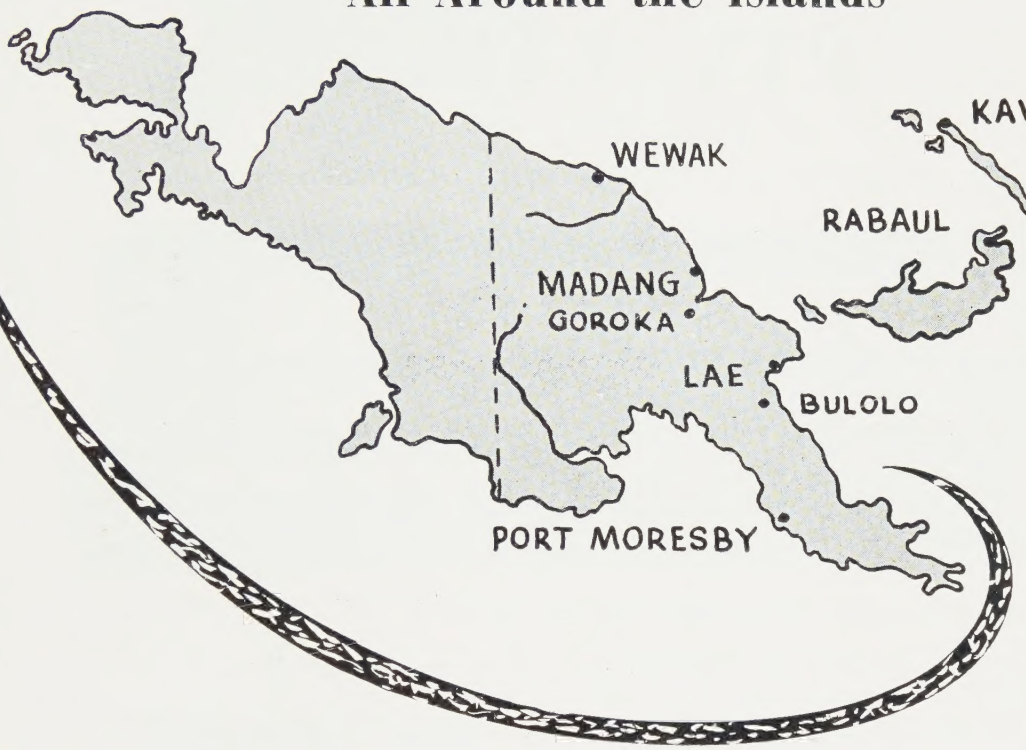

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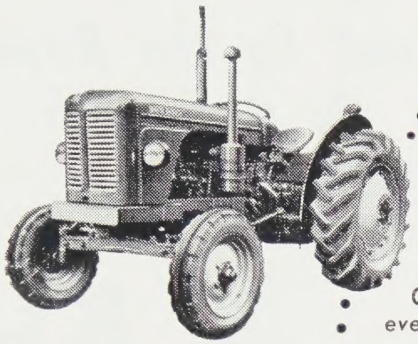

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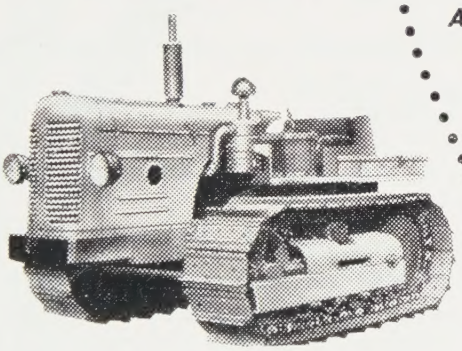

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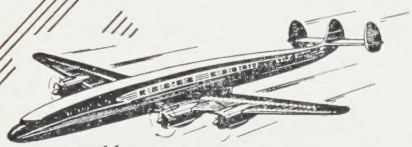

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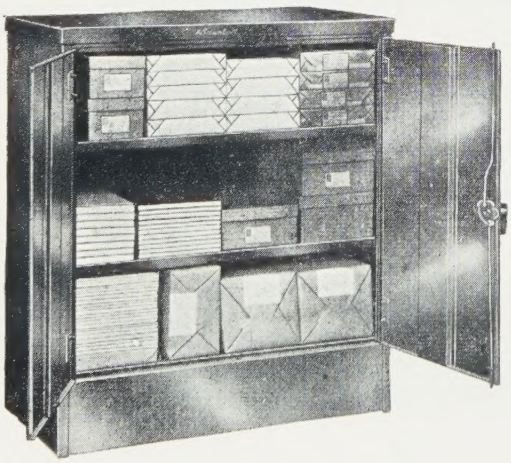

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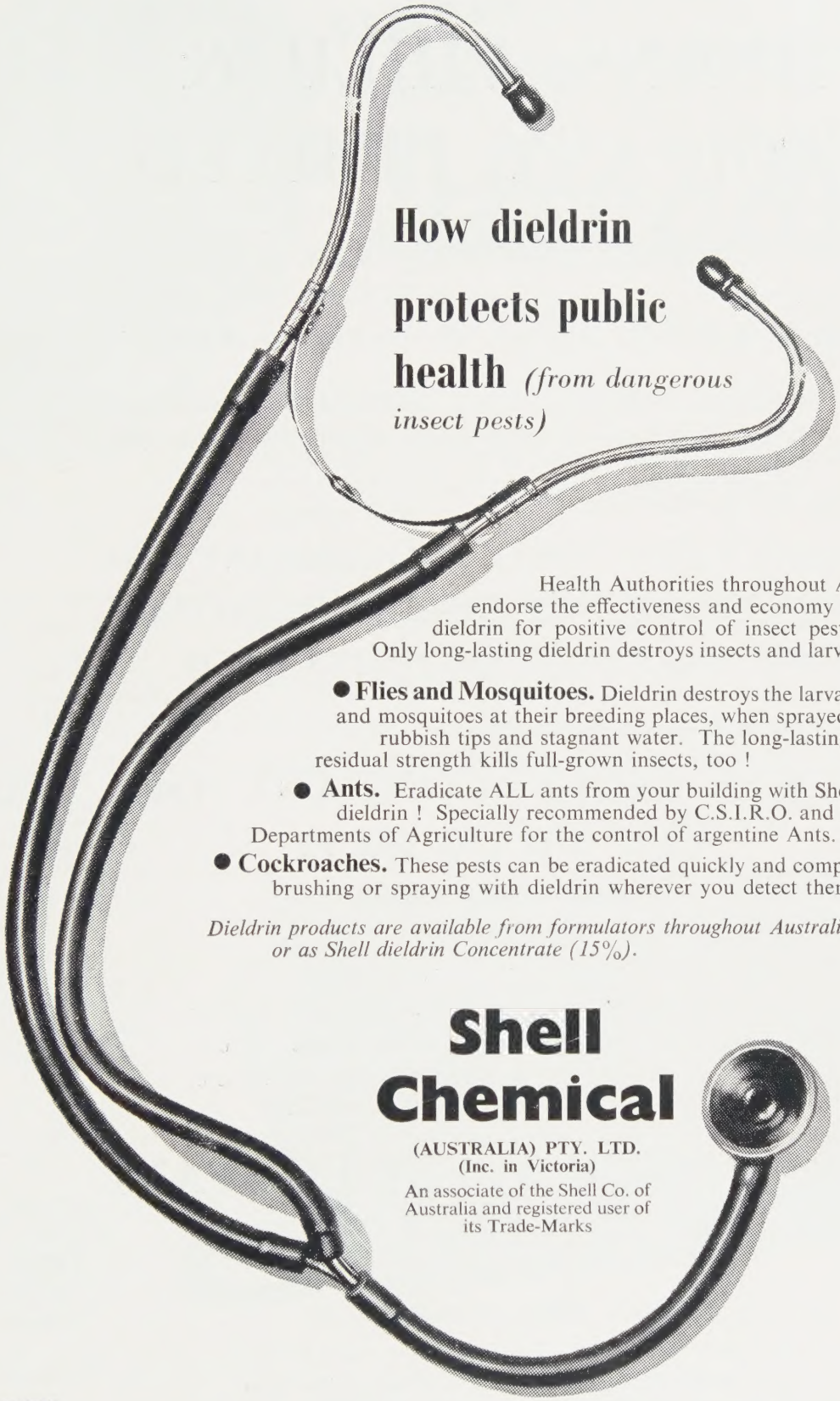

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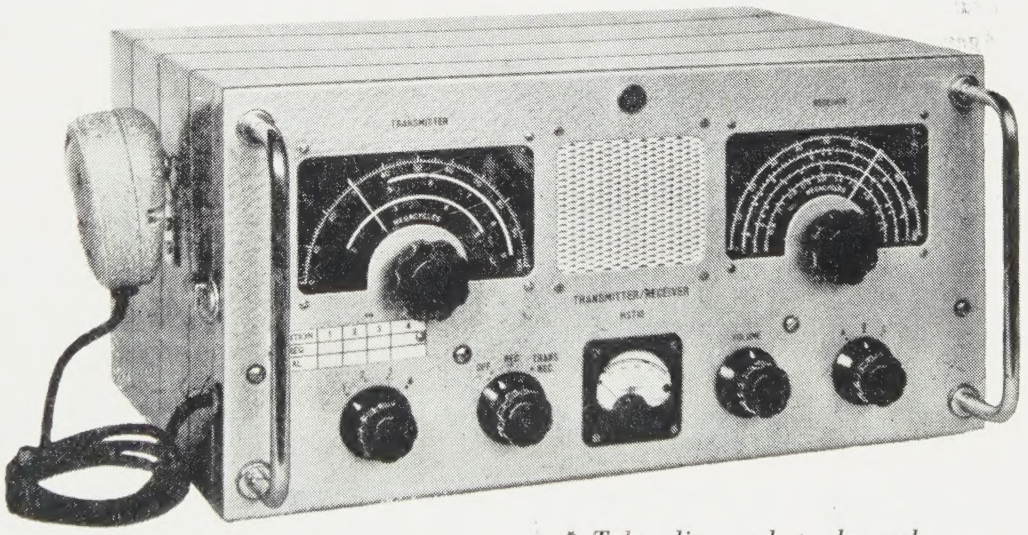

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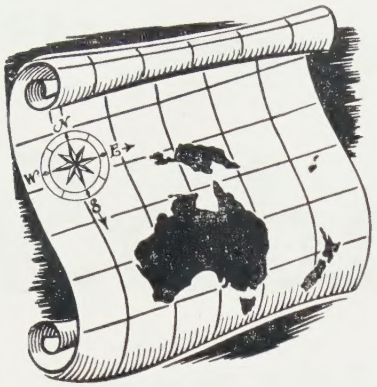

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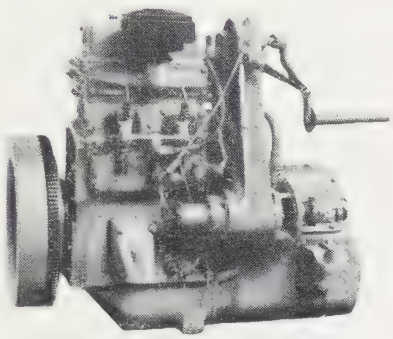

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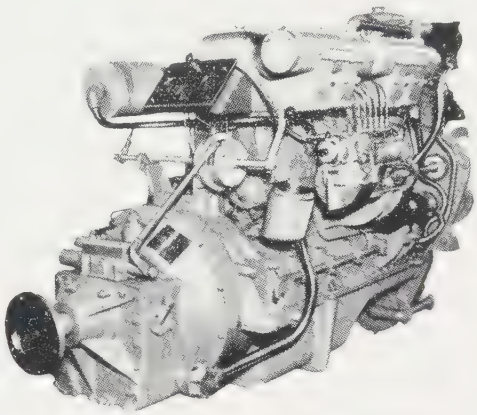

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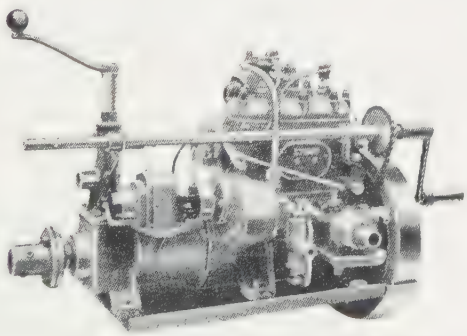

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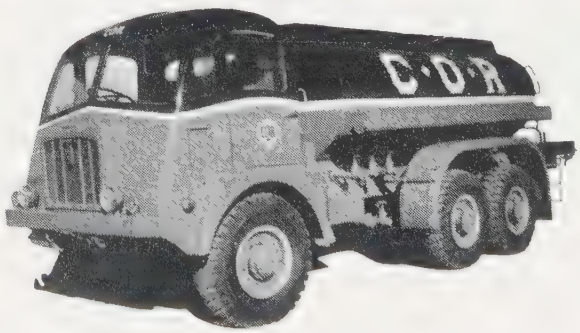

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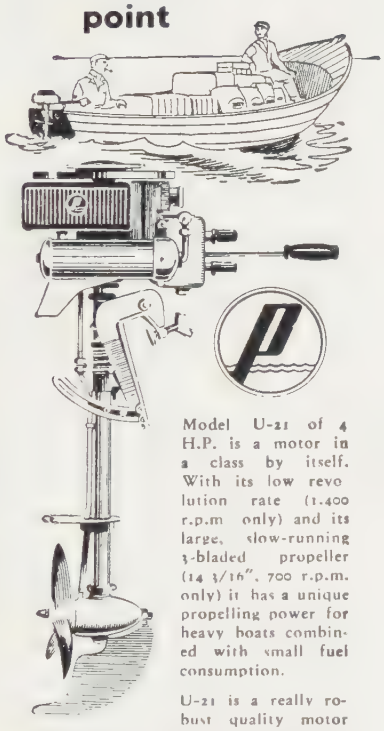

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The South Pacific Commission

The South Pacific Commission is an advisory and consultative body set up in 1947 by the six Governments responsible for the administration of Island Territories in the South Pacific region (Australia, France, the Netherlands, New Zealand, the United Kingdom and the United States of America).

The Commission's purpose is to recommend to the member Governments means of promoting the well-being of the people of these territories. It is concerned with social, economic and health matters. Its headquarters are at Noumea, New Caledonia.

The Commission consists of twelve Commissioners, two from each Government. It normally holds one Session each year. There are two auxiliary bodies, the Research Council and the South Pacific Conference.

The Research Council assembles once a year. Members are appointed by the Commission, and are selected for their special knowledge of the questions with which the Commission is concerned, and the problems of the territories in these fields. The chief function of the Research Council is to advise the Commission what investigations are necessary. Arrangements to carry out those that are approved are the responsibility of the Secretary-General and other principal officers.

The South Pacific Conference, which meets at intervals not exceeding three years, consists of delegates from the local inhabitants of the territories, who may be accompanied by advisers. The first Conference was held in Fiji in April, 1950, and was attended by delegates from fifteen territories and from the Kingdom of Tonga. The second Conference was held at Commission headquarters in April, 1953. The Third Conference was held in Fiji in April-May, 1956.

The Commission's Staff includes six principal officers, as follows: Secretary-General, Dr. Ralph C. Bedell; Executive Officer for Health, Dr. E. Massal; Executive Officer for Economic Development, Dr. A. H. J. Kroon; Executive Officer for Social Development, Dr. R. Seddon. The powers and functions of the Deputy Chairman, Research Council, are at present being exercised by the Secretary-General. The office of Deputy Secretary-General is temporarily vacant.

Further particulars of the Commission's activities may be obtained from the Secretary-General, Nouméa, New Caledonia.

NOTE: A map on which the Commission area is delineated appears on the inside back cover.

Front Cover Photograph

Travelling clinics of the maternal and infant welfare section of the Department of Health, Papua and New Guinea, visit native villages in the Port Moresby area by jeep and launch.

The front cover photo shows Miss I. Champion, a member of the clinic staff, weighing a baby in the village of Tupuslei ("Village-Over-The-Water"), which is built on stilts in shallow water just off a coral beach, twenty miles from Port Moresby.

SPC QUARTERLY BULLETIN

VOL. 7. No. 2 APRIL, 1957

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THE SPC QUARTERLY BULLETIN, first published in January, 1951, features articles on selected activities in the Commission's three main fields of operation: economic development, health and social development. Articles are also contributed by specialists working in these and related fields, in the territories within the Commission area.

THE BULLETIN is given selective world distribution to people and institutions in widely differing fields sharing a common interest in the purposes and work of the Commission. It is published in two editions, English and French.

SUBSCRIPTIONS and orders for single copies should be directed to: South Pacific Commission, Box 5254, G.P.O., Sydney, Australia. Advertising rates are also available from this address.

ALL OTHER ENQUIRIES relating to the SPC QUARTERLY BULLETIN should be directed to: The Editor, South Pacific Commission, Nouméa, New Caledonia.

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THE ORIGINAL TEXT of all articles is in English unless stated otherwise.

THE COMMISSION does not accept responsibility for statements made in contributed articles.

SPC – WHO Course In Health Education

The World Health Organization and the South Pacific Commission are planning a course in health education to be held in Nouméa in July-August next. The trainees will be educated island workers in the fields of education and health. The following article describes what the course is and what benefits are expected from it.

By T. C. LONIE*

Teaching from a health education poster. The health sister is addressing a women's committee in Western Samoa, while the district nurse and local medical practitioner assist. Next time they will give the talk themselves.

NEXT July, there will assemble at South Pacific Commission headquarters about fifty people from all over the Pacific, to spend two months learning and sharing together their knowledge and experience, their ideas and aspirations in the matter of health education. Some will be staff members with special knowledge and training in this field, already experienced leaders. Most will be younger people looking forward to passing on to the peoples of their own lands the knowledge of how to attain to a full healthy life of freedom from fear of sickness, and disease, and untimely death for themselves and their children.

And more than the specific subjects of their course, they will, in living together, learn much about each other, about the places from which all have come, of their diverse backgrounds of custom, and living and education. They will discover an underlying community of purpose, and a mutual appreciation of each other as fellow-workers in the health field.

This Health Education Course has been made possible by the co-operation of the World Health Organization, the South Pacific Commission and territorial administrations in the Commission's area, and is being subsidised by a substantial grant from the Technical Assistance Funds of United Nations.

The territorial governments are being asked to be responsible only for the one-way fare of students from their home countries to Nouméa. All other costs of the Course, boarding, accommodation, other travel expenses and even pocket money are being met from international funds.

Below is described exactly what it is hoped to do in this Course, and what benefits are anticipated for the island territories within the Commission's area.

Medical Needs Of The Pacific

First of all, a few general remarks about needs. The health of the peoples of the Pacific can and is being assisted by the expanding medical services in each territory. The major preoccupations of these services is the relief of sickness *which has already occurred*. Of the need for this there can be no question. Common humanity demands that the sick are cared for and, if possible, nursed back to health.

The mass campaign is the same thing in essence, but is directed against one disease, and constitutes an attempt to stamp it right out of the community by finding and treating every case that can be found. It is a great help because even if it does not completely eradicate a disease, it can be prevented from ever becoming a real danger because the number of cases is so greatly reduced. We may well now ask whether all this is not sufficient. Is there really a need to do more?

Is Health Education Really Necessary?

Healthy living is not something which is instinctive and inborn. A burnt child dreads the fire because the relationship of the burn to the fire is immediately and painfully apparent. But the relationship of an inadequate diet to ill health; or a mosquito to malaria or filariasis; or faeces and flies to dysentery is not immediately apparent. It took the human race thousands of years, and much thought and technical knowledge to work out these relationships, and even now our knowledge is very incomplete. Meanwhile, many millions of lives have been lost. That was bad enough when we were ignorant of the facts. Clearly it would be criminal not to pass on the life-saving knowledge we have now acquired.

Health education is just as necessary and just as important as any other kind of education, and rates as high a place. It is equally an integral and essential activity of any well-designed national medical service. In primitive communities it may be literally a matter of life and death.

In most, if not all, of the territories in the Commission's area the principal causes of death and disability still derive from a lack of knowledge and application of the elementary laws of good hygienic living.

Finally then, the only real way of getting rid of the principal infectious diseases in the community, and the only way to prevent illness of all kinds, is to live in the right way—to eat the food we ought to eat; to avoid what we ought not to eat; to treat our bodies as they

* Dr. Lonie is Research Officer for Health to the South Pacific Commission.

ought to be treated by the right kind of exercise, and by the avoidance of conditions and dangers that might interfere with their correct functioning; to be clean in personal habit and in our surroundings; and to see that our environment is so conditioned that it is not a danger to us.

It is to spread this kind of knowledge —the 'know how' of healthy living— that is the important work of health education. And remember that this is of the very greatest importance for village life in the Pacific and it is in villages that most Pacific people live.

For instance, it is of great importance to village people to know how to prevent pollution of their village well or water supply stream. If they do not do so they stand the risk of dangerous diarrhoea, or dysentery, or typhoid fever. The danger is right on the spot. With a piped water supply, on the other hand, the responsibility of keeping it safe falls on a local authority or government department, and in any case the source is likely to be away from the habitations of men, and therefore from the dangers of immediate pollution.

And so with many other conditions.

On the other hand, the measures required in a village are usually simple and easy to apply. But they must be learned and be practised continuously and conscientiously, and with knowledge.

Who Are The Health Educators?

There are in most villages or districts of any size in the majority of island communities, certain persons who may be expected to help in the health education of the people, and who are, to that extent, health educators.

It is important to realize that anyone whose work includes the teaching of the rules of healthy living to individuals or groups in their homes, in their village gatherings, or in their school, is a health educator. The district nurse, or baby nurse, or health nurse, is a health educator. The locally-qualified medical practitioner, medical assistant or dresser responsible for the medical care of a district is a health educator—health education is part of his work. The teacher in his school curriculum, giving lessons in simple hygiene and good physical habits. is a health educator. So is the sanitary inspector as he goes his rounds advising the people as to refuse disposal, sanitation, water supplies and so on.

Not always all of them will be in a village at one time, but they will be either living there, or visiting at frequent intervals. These are the people who belong to the community, who know the customs and attitudes of their neighbours, and who can be of the greatest value as teachers (and exemplars) of the habits of healthy living.

The district nurse explains to one of the cast what she is to do in the filmstrip "Scabies", made in Western Samoa.

How Can We Help Them?

This is especially the group of people from whom it is desired to recruit the trainees for this Health Education Course. In one way or another teaching in health education is already part of their job. We want to fan their enthusiasm, to give them the fresh fuel of new and up-to-date knowledge. We wish to let them see this great work through the eyes of colleagues and instructors, and to see it as a matter important not only to individuals, but to the community of which the individuals form a part.

In these days of desire for the full use and control of the wealth and resources of their own lands, we wish to inspire our island trainees with the thought and the knowledge that national health is a national capital asset which they, and ultimately only they, can add to, and build up.

Finally, we want to send them home as burning brands to kindle and re-kindle a like enthusiasm among their colleagues, and among their own peoples. This is not an attempt to give theoretical training on a high level to administrators. It is intended to teach those who will *themselves* teach, to give them training in how to put their ideas across to their own people in a way which will not need either elaborate apparatus or more than basic knowledge.

About The Trainees

Let us note here that, though the number of trainees must be limited to forty, it is not strictly necessary that these all be government employees. In some territories, educational and medical work is carried out by private organizations, chiefly missions. There is no reason at all against, and in fact many very good reasons for, some of the student places being made available to such bodies for appropriate members of their staffs who are of local origin.

But clearly where governments take the major responsibilities in health and education, their candidates should have preference. In some cases, they may wish, however, to sponsor candidates nominated by missions. This is a matter for local decision, but it would be a pity if places were allowed to remain vacant because the point was not made clear.

A word about where the students will come from. We hope that they will reach Nouméa from French Oceania in the east to Netherlands New Guinea in the west, and from New Caledonia and Tonga in the south to the Mariana Islands well beyond the Equator in the north.

Their races will be equally diverse: Polynesians from the east, Melanesians from the west, and the island peoples of Micronesia in the north. While this means that we shall have trainees from lands of widely-varying culture so far as the local peoples are concerned, the fact that students have already had professional training of some sort will mean that the level of learning is reasonably even.

The Course languages will be French and English, so students must know one or other of these languages. That is to say, all papers and documents will be in one or other of these languages, and

Left: Nurses at the Central Nursing School, Suva, making pictures for flannelgraphs to illustrate their talks on infant feeding. Above: A good place to teach health. In the open-air "well-baby" clinic the Samoan sister in charge is a trained 'Plunket' nurse. Mothers are Samoan and European.

there will be provision for interpretation when this is required.

Teachers will have been through training colleges, assistant medical practitioners will probably all, or nearly all, have been through the Central Medical School in Fiji, and nurses will probably have had broadly similar training.

All will therefore start off the Course having already had sufficient basic education to assist them in acquiring more.

Differences will tend to be smoothed out during the Course, and such differences as there are will add interest to the contacts between the trainees.

Choosing The Best People

Within the groups from which they will come, let us indicate the type of person who should be selected. As to age, it will be best to send someone who has already had some practical experience in the field, and has shown clear capability both in learning and in imparting knowledge. Age is important, too. This is not a course for the young and irresponsible. Equally, the students must not be too old to assimilate new ideas, and they should have prospects of a sufficient number of years' service ahead.

The trainee should be active, energetic and keen. It is just waste of time and money to send along someone without sufficient education to grasp the teaching given, though, of course, that will be given in as plain, direct terms as possible. Also there has got to be enthusiasm. We do not aim to light a candle of knowledge to waste its illumination in a back office!

It will be well, too, to assess the personal qualities of the student in relation to his equals, to those he will have to teach or to direct, and incidentally to those senior to him in position or age. This is rather important. However great the enthusiasm, the person who is not capable of getting support from those with whom he works will not be a great success. Furthermore, the trainee should be temperamentally able to work and live in close contact with his colleagues during the Course, to share with them in the work of the Course and in their community life.

Both sexes will be represented in the Course. This, of itself, is a feature of interest since it is a pointer to the fact that in subjects like health and education, both men and women are able and need to co-operate in service. This healthy relationship in serving the needs and helping the development of the community is of great promise in the emergence of a well-balanced national life in the territories.

—And The Best Staff

The staff of the Course are being selected with great care. They are all of them specially qualified in the particular subject they will present. Several of them have already had experience of such courses, and several have degrees or diplomas in health education. Practically all of them have recent knowledge and experience of field work in health education among Pacific peoples. They are therefore persons who know the subject not only from the theoretical but also from the practical point of view.

At the time of writing it is not possible to give a complete list, because final agreement has not been reached with the persons and administrations concerned, but on general terms the above describes the persons who will assist in the Course.

How They Will Learn

The plan of work will not simply be a matter of formal lectures. Every aspect of the subject will be examined and discussed in detail in small groups, which will be able to deal with individual difficulties, and will foster close personal relationships between the members and the group leaders. Opportunity will be given to students not only to see all the types of visual aid in common use, but to learn to make and use the types likely to be most helpful for teaching, especially for teaching groups of village people.

Training in presenting the different parts of the subject will also be given. All this of course will be illustrated by demonstrations and practical work. At every stage care will be taken that the teaching is not so complicated or advanced as to be beyond the particular group under instruction, or beyond the amount the trainee is likely to require.

Arrangements are also being made for students to see health education work demonstrated in the schools and villages of New Caledonia. This is being made possible by the kind co-operation of the French Administration.

After The Course, What Then?

Let us now consider the student who has completed the Course. It will have been for him an experience to remember for the rest of his life. The daily work, the daily contacts with colleagues and instructors, the close attention for two months to this one subject of health education cannot fail to have made an indelible impression.

In addition, he will have acquired, we hope, a good deal of solid knowledge, a sense of direction in this aspect of his work, and inspiration to share his knowledge with those around him. We hope that he will himself have acquired an attitude to healthy living that will make it natural and instinctive to him to "think that way".

What is to happen to him when he goes back? It is not planned that he should be regarded as an expert in health education who can then organize this work for his department. After all, intensive as the Course may be, it is not designed at a sufficiently high level to serve this purpose. If it were it would

certainly be beyond the level at which the proposed trainee could profit by it.

Furthermore, no course in health education lasting only two months could be a completely adequate training. This is, in fact, a course with a limited objective, but the result should meet the designs, and that is that within their departments, and as an extension of their normal work, the trainees should be able to pass on in an effective way, not only health education itself, but, to their colleagues, some indication of the methods of teaching. How this is to be done in the various territories depends on local circumstances, but one visualises it operating something like this.

Let us take the case of a teacher. He might be employed for a period in giving demonstration health education lessons to village schools. His colleagues in watching him should learn something of the methods employed, and this could be supplemented by later discussion. It might be later that in a larger school, he could be charged with the giving of lessons in hygiene for several classes. The possibilities are many.

Or take the assistant medical practitioner or medical assistant who has attended such a course. He could be employed on a visiting mission, as it were, to stimulate this work among his colleagues, previous planning allowing him to give, in villages or centres, health education talks and demonstrations. This would stimulate attention to the subject in the district medical staff and in the minds and thoughts of the people. Similarly, the nurse could visit other district nurses.

It is the same technique as that of the visiting evangelist. It focuses attention on and stimulates enthusiasm for whatever 'good news' is to be spread. The method dates back at least to St. Paul's day. Of course the stimulus has to be repeated from time to time; that is normal. But the impetus given and the momentum gained is never wholly lost. Always some advance has been made, and from the new 'jumping-off place' we may advance further next time.

More Help For The Future

Even now, we have a means to prolong and consolidate the work of the Course. It is proposed to appoint a fully-trained health educator who will not only assist with the Course, but will, for a two-year period, be available to visit, advise, and assist Course trainees when they return to their territories.

Naturally the need for his services will vary from area to area. Where the administration already employs a senior health educator there may be no need at all for further follow-up work so far as the South Pacific Commission is concerned. Many territories, however, have no such specialist officer, and will desire visits and advice from the health educator, both as to the best employment of Course trainees, and also probably to advise on the general organization and planning of health education in the area. That advisory service of course will be at no cost to the territory, the cost falling on international funds.

A group of Samoan mothers attending a clinic for guidance in the upbringing of their babies.

The Story In Brief

In conclusion, and briefly, here is the story. It is claimed that health education, including nutrition education, is necessary in the island territories of the Pacific if adequate standards of freedom from disease, and healthy living are to be attained and maintained among the people.

Sponges In Rakahanga Lagoon

Contributed by Ronald Powell, Cook Islands

DURING a recent visit to Rakahanga Islands we explored the area in which sponges seem to grow very well, and in a few minutes collected about twenty from 9″ to 20″ across.

We left these sponges, which when gathered are a black jelly-like mass, to be processed by the Rakahanga people, who clean them by first burying them just above high tide level for a few days, when the jelly-like mass rots off. The skeleton is then washed out and sun-dried.

At time of writing it is not known what variety of sponge these are, or whether this variety has any commercial value. It is superficially similar to the sponges used in industry, which command quite a high price, and for which has always existed a demand greater than the supply. Like trochus and pearl shell, sponges seemed to have been over-fished in most parts of the world where they grow naturally.

No one in the atolls seemed to be able to recognize any different varieties, and as I made enquiries people came up with the most conflicting statements. I found natives who had grown up on Manihiki who did not know the native name for a sponge, while others had never even noticed them growing. I came away feeling that if these lagoons were searched carefully, other varieties might well be found. Unfortunately there is such a limited time during the loading of local shipping that little can be done ashore. Almost everyone has business to transact and letters to write. There is never much labour offering nor is there time available for men whose opinion would be worth considering to carry out a search while the ship is lying outside the reef.

It is, however, hoped that more information will be available soon on the commercial possibilities of planting sponges in the region. It is well known that the Japanese were successful in planting and growing sponges in the Caroline Islands before World War II stopped this work. Sponges have also been grown successfully in the Gulf of Mexico, although repeated hurricanes have often destroyed these otherwise successful plantings.

Rakahanga Lagoon seems to be the most likely at present in this Group for such a project.

Rubber Industry Expands In Papua And New Guinea

Rubber plantation of Messrs. Kienzle Brothers at Kokoda in the Yodda Valley, Papua and New Guinea.

The rubber industry in Papua and New Guinea is being vigorously developed to an official plan of action approved in 1954. New areas are being planted, and old re-planted, with high-yielding material imported from abroad and multiplied for growers in nurseries and seed gardens established by the Administration. Research and experimental work is being expanded, while official inspection and grading procedures now ensure that rubber shipped from the territory conforms with manufacturers' standards in respect of quality and packing.

THE rubber industry in Papua and New Guinea has developed entirely in Papua, where the main areas of production are on the Sogeri plateau, near Kanosia, and in the Kokoda/Yodda area. The present area under rubber is about 28,000 acres. Many of the plantings date from the first decades of this century and the yields from the tree varieties then planted are low. Research in the various rubber-producing countries of the world, particularly Malaya, has developed trees capable of yielding several times the quantity of rubber which the Papuan trees now produce.

Most of the rubber used in Australia is imported from Malaya. Only about 7% is imported from Papua and New Guinea, but the territory is capable of producing all the rubber Australia requires.

In April 1954 the Minister for Territories approved a plan of action for further development of the industry. Principal features were re-planting of old, low-producing areas with high-yielding planting material, opening up of new areas for rubber-growing, research and experimental work, and improvement in methods of rubber preparation for market.

Since the announcement of this plan considerable progress has been made by the Australian Government in the promotion of rubber production in Papua and New Guinea. New areas have been planted and old areas re-planted with high-yielding trees. A scheme has been introduced under which the air freight charges on private importations of high-yielding rubber seed and budwood from approved overseas sources is subsidised by the Government. Research work by the Administration of Papua and New Guinea has expanded.

Research And Experimental Work

An indication of the drive behind the Government's programme of rubber research is seen in progress made with establishment of the Government rubber experiment station at Bisianumu, where high-yielding varieties of rubber, assembled from overseas, are grown.

The station includes budwood nurseries and a seed garden where the best planting material from rubber-growing countries is being established, multiplied and made available to rubber growers in the territory. Progress is limited only by the amounts of suitable budwood available, but it is anticipated that all 40 to 50 acres of the seed garden will be planted up in the coming year.

Recent importations into the budwood nurseries have included some of the most advanced planting material in Malaya, known as the "600" series of the Rubber Research Institute. As a result of this and other outstanding importations, and the establishment of the Bisianumu nursery, planting material equal to the best in the world will soon be available to territory planters, so far as certain restrictions on distribution permit.

Small quantities of budwood of certain types (sufficient for planting to establish budwood nurseries on plantations in which planting material can be multiplied) are now available to the industry. There is no legal restriction on the distribution of some of this budwood, but most of the more valuable material is "restricted," which means it may be sold only under certain conditions laid down by the proprietary body which produced it.

The Administration of Papua and New Guinea has already obtained permission

Rubber tappers setting off on their daily task.

A rubber tapper at work on Koitaki plantation. The latex sap flows along the V-shaped groove cut in the trunk, into the tin cup, which holds the yield over 24 hours.

for the distribution of some "restricted" selections within the territory, subject to the payment of a bounty to the owners, and it is hoped that present negotiations will result in sales agreements regarding other "restricted" material. When these agreements have been made, the budwood will be advertised for sale.

Hormone Treatment To Stimulate Yields

Interesting experiments using hormones to stimulate yields will be carried out at the Government's rubber experiment station at Bisianumi.

Treatments have been evolved, based on the experience and recommendations of the Rubber Research Institute of Malaya. They will vary in severity according to the degree of tree damage which can be tolerated in rubber stands of various ages, and according to the effectiveness of the applications.

A heavy application of stimulants is particularly suitable for older trees which are being slaughter-tapped prior to cutting out. This heavy application of hormone treatment may lead to the death of the tree in six to twelve months, but the objective is to obtain maximum yields until death of the tree.

It is also hoped to evolve a treatment which can be applied from time to time to young rubber to give an increased yield without causing permanent damage to the tree.

Training In Budding Technique

Rubber budding work is important in developing plantations of high-yielding trees. It is a grafting process in which an "eye" or bud with a small area of bark is taken from a young branch (of high-yielding material) and carefully attached to another young plant. The purpose is to transfer the high-yielding attributes of the plant from which the bud was taken to the other plant.

The technique calls for skill and the observance of certain precautions for success. Private planters are assisted if trained staff is available. Selected natives are being trained by the Government in budding and nursery techniques.

Opportunity is taken to keep rubber planters in touch with all phases of the development work which the Government is carrying out. During the last 12 months, 175,000 rubber seeds have been imported by seven estates in the territory under the Government subsidy scheme. Virtually all new planting is being made with high-yielding material.

Papuan rubber tappers with buckets of latex they have collected.

Field Day For Rubber Planters

In December 1955 a field day for rubber planters was held at Bisianumu. This event stimulated further interest in the commercial use of improved planting material and in the Administration's work with rubber.

The opening address by the Chief of the Division of Plant Industry of the Department of Agriculture, Stock and Fisheries, stressed the need for planting with the highest quality planting material and outlined the experimental work which the Department of Agriculture, Stock and Fisheries was doing and proposed for the future. Other addresses were given by experts in diseases, pests and nursery practice and vegetative propagation. Native budders demonstrated their techniques during a conducted tour of the station.

Later, the Secretary of the Planters' Association of Papua expressed appreciation of the value of steps being taken to make available high-grade planting material.

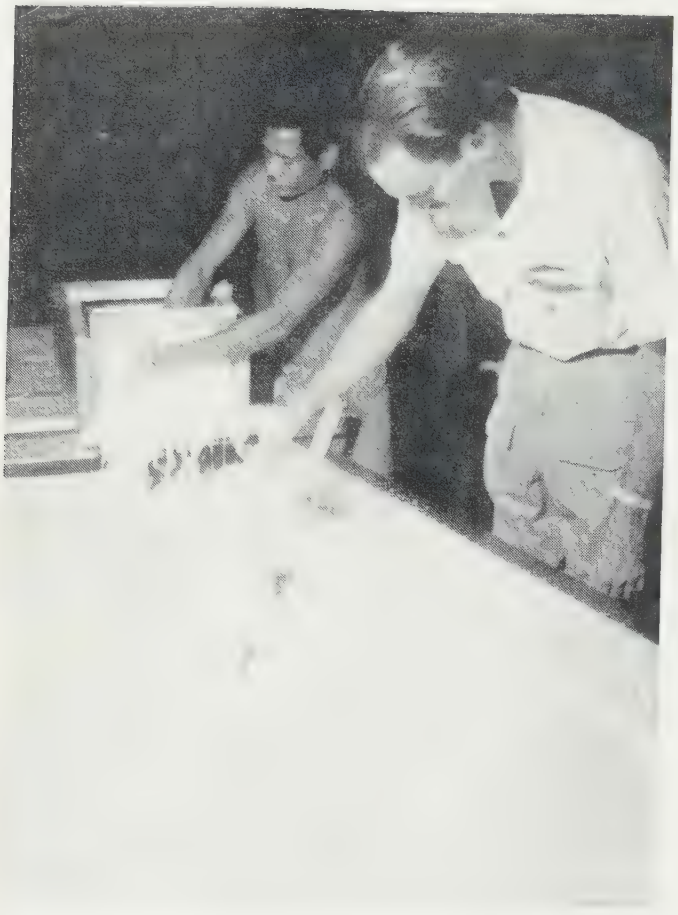
Simple booklets on rubber-tapping procedures, supplied by the Rubber Research Institute of Malaya, have been passed on to the Planters' Association for assistance in instructing natives in tapping.

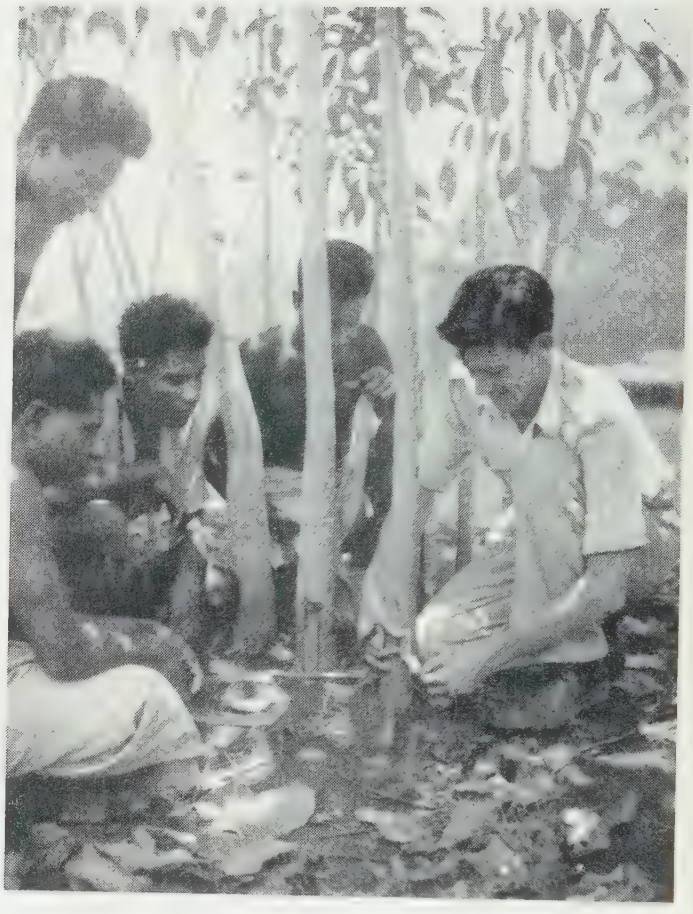
Disease And Pest Control

The rubber industry in Papua is in a singularly favourable position in regard to freedom from pests and diseases. The South American leaf blight, which causes serious loss in South America and the American tropics, is unknown in the south-east Asia and Pacific regions. Territory legislation prohibits the introduction of rubber-planting material from affected areas.

A tip blight of young seedlings and buddings has occurred, but this is of only very minor importance to commercial producers using seedling material, since the trees are affected only in the young stage and the condition is soon outgrown. It is desirable, however, to control this trouble in the plant nurseries.

Sheet rubber being placed in the smoke house on Awala plantation. The attendant is an Orokaiva native wearing the garb of his people, a length of tapa cloth patterned with traditional designs.





Above: Testing latex in the coagulating tank on Koitaki plantation, to determine the dry weight of rubber per gallon of latex. The specially-graduated hygrometer used for the purpose is called a "metrolac". Right: Trainees at Sogeri Agricultural Station being instructed in the bud-grafting of young rubber trees.

Grading And Competition

It is, of course, important under conditions of open competition that rubber shipped from the territory be up to the standard required by manufacturers in regard to quality and packing.

In 1954 the Government prescribed standards for classification of rubber to ensure that Papuan rubber is graded in a uniform manner according to the standards generally accepted in consuming countries. Government legislation provides that rubber shall not be exported until it is classified into a prescribed grade. Advice is given commercial rubber producers on grading, packing and baling.

A Rubber Board to which the owner or exporter of rubber may appeal regarding the grade into which rubber has been classified by an inspector, has been constituted under the Ordinance.

Standard type rubber sheets have been obtained to assist growers in meeting market requirements, and arrangements are being made to obtain samples of polythene-lined paper containers for the purpose of studying its suitability for packing certain grades of rubber.

Recent Expansion Of Industry

An indication of progress in rubber production in Papua and New Guinea during recent years is seen in the increased rubber exports, which rose from 1,198 tons in 1948-49 to 3,789 tons in 1955-56.

The estimate of rubber production for 1957-58 is 4,000 tons, valued at £1.27 million. When all the trees planted at the time of the last published census (March 1955) are in full production (about 1964) it is estimated that the volume of production will be about 4,250 tons per annum, valued at £1.35 million (assuming present prices).

An indication of further possible expansion is given by the fact that a reconnaissance survey has revealed that 10,000 acres of Crown land near Abau in Papua would probably be suitable for rubber. Another survey to assess the potential of various parts of Bougainville is proceeding. Last year rubber was planted for the first time commercially in the Markham Valley in New Guinea. High-yielding seeds imported under the Government subsidy scheme were used.

Industry Entering New Phase Of Development

The rubber industry of Papua and New Guinea is entering a new phase of development, based on the establishment of the highest quality planting material. The Government is fully aware that a considerable area of existing rubber stands is over age, and considers that its scheme for subsidising the importation of high-grade material, coupled with the establishment of nurseries and seed gardens by the Administration, and official inspection and grading, will keep the rubber industry of the territory in line with the best world standards.

New Pacific Bibliography from University of Hawaii

The Interdepartmental Seminar on Pacific Islands Research at the University of Hawaii has prepared a *Bibliography of Sources on Personality and Culture of the Pacific Region.* It contains 537 items. Copies are available free from the Department of Anthropology, University of Hawaii, Honolulu 14, Hawaii.

South Pacific Fisheries Training Course Closes

Twenty-five trainees from fourteen Pacific island territories attended the Fisheries Training Course held under SPC-FAO auspices at Noumea from November 19 last to February 21. This article briefly reviews what the author describes as "a fine example of international co-operation."

On the Noumea waterfront. Mr. H. van Pel (centre), fisheries officer to the South Pacific Commission and Director of the Fisheries Course, discusses local fishing techniques with M. Garcia (extreme right), skipper of the fishing boat in the background, while Fisheries Course students listen with interest.

NOW that the Fisheries Training Course has closed, it seems an appropriate time to review its worth and to consider if the aims of the Course have been achieved.

The purpose of the Course was to train selected men in the basic knowledge of fisheries and related skills. Such men are needed in nearly every territory in the South Pacific region for the development of fisheries.

Twenty-four trainees followed the complete Course from November 19, 1956, to February 21, 1957, and five observers attended for various subjects. One student, because of illness, could not complete the last part of the Course.

The trainees came from the following territories: Papua and New Guinea, 5; New Caledonia and Dependencies and the Trust Territory of the Pacific Islands, 3 each; Netherlands New Guinea, American Samoa, British Solomon Islands Protectorate, Cook Islands, 2 each; Western Samoa, French Oceania, New Hebrides, Niue, Guam and the Kingdom of Tonga, 1 each. The observers came from New Caledonia, Papua and New Guinea (two each) and from the New Hebrides (one).

Eleven lecturers took part, including the Director, Mr. H. van Pel, and the co-director, Mr. P. Lusyne. Both the Director and the co-Director were employed for the full time of the Course. The total time of lectures, both in class and in the field, was 373 hours, made up as follows:

1.	*Knowledge of fish and their behaviour*	21 hours
2.	*Elementary knowledge of the sea*	11 „
3.	*Fishing gear*	78 „
4.	*Fishing operations*	111 „
5.	*Handling, transport and marketing*	10 hours
6.	*Fish processing*	12 „
7.	*Fish culture*	37 „
8.	*Conservation and protection*	18 „
9.	*Fishing craft*	53 „
10.	*Problems of management*	22 „
		373 „

The lectures were given simultaneously in English and in French. Many field trips were made and also four trips in the fisheries research vessel *Orsom III*, belonging to the French Institute of Oceania.

This is the first time that a training course has been held for South Pacific islanders, coming from various territories, and the results of this Course have been very satisfactory indeed. This is certainly for the major part due to the intelligence, diligence and lively interest of the participants, who proved to be highly suitable to this type of education. We have reason to expect that these trained men will be of real value to their home territories. However, only the future can show if our high expectations will materialize.

In this respect, it is certainly encouraging that some proof of the value of the Course has already come to light. The two trainees from the British Solomon Islands Protectorate successfully introduced *Tilapia mossambica* on their arrival back in the Solomons. Furthermore, a scientist in the United States of America is seeking contact with our ex-students with a view to collecting information on the occurrence and movements of specific fish species. Most of the trainees have, or will get, jobs with local fisheries services, and we are quite confident that they will serve well their home islands and island groups.

The South Pacific Fisheries Training Course has been a fine example of international co-operation. The Food and Agriculture Organization of the United Nations, the French Institute of Oceania, the French Government and the South Pacific Commission staff all worked together in perfect harmony to obtain the high standard of efficiency of this Training Course.

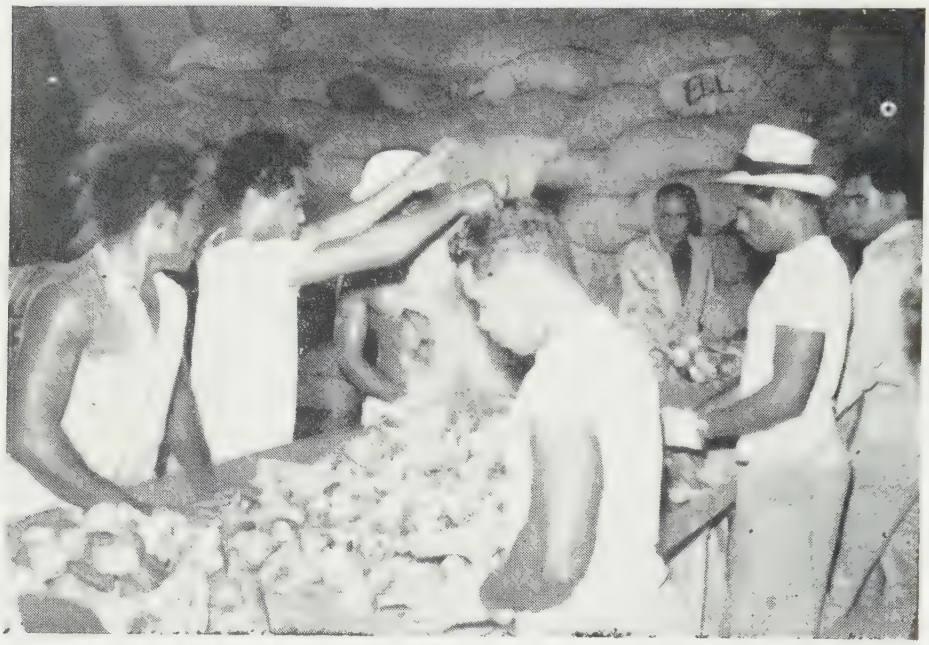
Fish Drive on Palmerston Atoll

Contributed by Ronald Powell, Cook Islands

During a recent visit to Palmerston Atoll we were able to sail across the lagoon and take part in a fish drive. The only gear used was a long scareline, made by splitting and twisting coconut fronds together. This was dragged across the shallow water on the reef.

This simple method of fishing is commonly practised on this atoll, and yields catches of up to half a ton in one haul. The gear costs nothing, is easily replaced and is well suited to this reef. In the short time we had available, one haul yielded about one hundred fish weighing from 1-1½ pounds each.

Trochus Studies In U.S. Trust Territory



Grading trochus shell in Palau, 1956.

Mainly in the 1930's, an extensive trochus transplantation-programme was carried out by the Japanese in what is now the Trust Territory of the Pacific Islands, under United States administration. A main objective of the current Trust Territory Trochus Research Project is to determine whether or not the islands planted now have trochus in commercial quantities. Another objective is to introduce trochus to new areas. Below is a report on progress made with the project to date, by the officer in charge . . .

JOHN R. McGOWAN

Marine Biologist, United States Trust Territory of the Pacific Islands.

AS an export item the trochus industry of the Trust Territory of the Pacific Islands is second only to copra in value. It has been harvested ever since German times (1898-1914) in the Palau and Yap Islands, but its development as an industry is fairly recent in the rest of the Trust Territory. At present there is an annual catch from Palau, Yap, Truk, Ponape, Saipan and occasionally small amounts from Majuro, Jaluit, Ailinglaplap and Arno.

The reason for this extension of range (about 2,500 miles) is that during the Japanese era (1914-1945) an extensive transplantation programme was carried out. Although detailed records are not at present available it appears that most of this work was done during the 1930's, and that trochus were introduced to many islands and atolls. The stock for these introductions came from Palau, where *Trochus niloticus* is indigenous. The animals were transported in the live bait wells of Skipjack boats and placed either in the passes of barrier reefs or merely scattered on the outside of these reefs in about 10 feet of water.

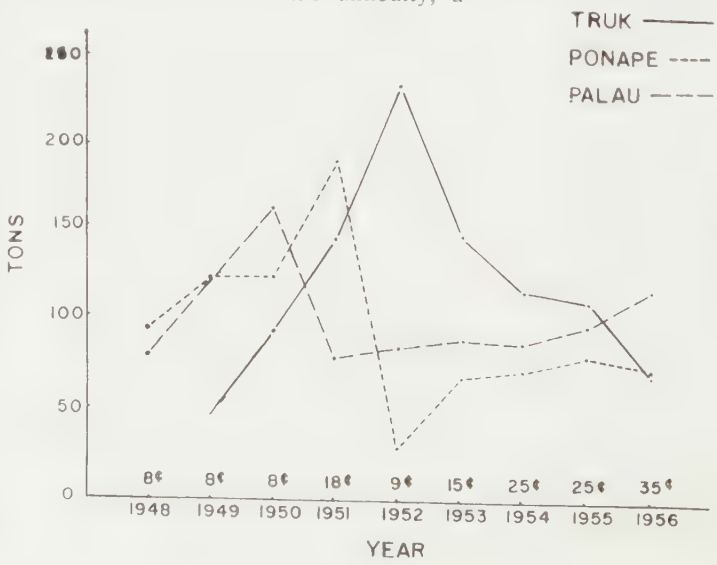
Islands known to be planted are: Truk, Ponape, Saipan, Majuro, Jaluit, Arno, Ebon, Mokil, Ngatik, Ailinglaplap, Pulawat, Ulithi, Ngulu, Nukuoro, Kapingmarangi and Pingelap. Some of these introductions were supervised by a professional biologist working for the Japanese Government, but others were not.

It is said that various companies as well as private individuals also introduced shell to many of the smaller, more isolated islands of the Territory. Several of these introductions were unsuccessful, according to the natives. One such attempt was made at Nukuoro where the adult trochus which were brought in managed to survive but the juveniles all died as soon as they reached a certain size.

There are other rumours from other islands that while the introduced trochus did manage to establish themselves, the population density is quite low. However, observations that trochus is either rare or abundant depend to a great extent on the observers' experience, and since the people from these islands have had no previous experience diving for shell, this statement must be open to question.

In order to resolve this difficulty, a survey technique has been developed by the current Trust Territory Trochus Research Project that will enable us to determine whether or not these islands have trochus in commercial quantities. It is one of the objectives of the Trochus Research Project to survey these islands, and if the results are favourable, to assist the inhabitants in developing this resource.

Another objective of the project is to introduce trochus to new areas. This aspect of the work is being delayed until we have a better understanding of the ecology of the larvae, juveniles and adults. It would also be desirable to have a knowledge of the growth rate of in-



Production curves for the main trochus-producing islands of the Trust Territory. The prices per pound paid to the diver is shown on the abscissa.

dividuals and of populations. This would help us to predict at what point we could expect to begin harvesting the new population and at what level to harvest them, i.e., what percentage of the adult population could we safely remove every year.

The results of the Japanese work can give us some indication of what to expect when we introduce trochus. For instance, a total of 6,724 shells were planted at Truk in 1927, 1928, 1929, 1930 and 1931. According to Japanese reports there was no harvest until 1939, when 7 tons were taken. The following year a little more was taken, and then the war interfered and little shell was produced for commercial purposes until 1948.

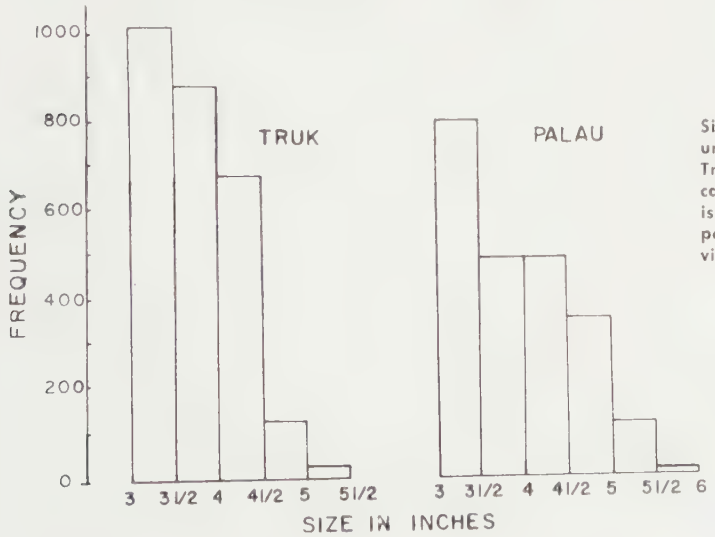
The production curve for the years subsequent to 1948 indicates an extremely rapid rise in production, followed by an equally abrupt drop and then a tendency towards levelling off. Production curves such as this one are difficult to interpret because they are affected by both biological and economic factors. The price of a fisheries product often has a great influence on the intensity with which it is fished, and therefore the size of the catch does not necessarily reflect the size of the population available to the fishermen. However, in the case of the Truk trochus catch curve, the peaks and troughs seem to have little relationship to the market price, and we must assume that at least part of the curve indicates, in a general way, what is really happening to the Truk trochus population.

The trends indicated by these curves are similar to many of the world's great fisheries, and although much of the information necessary to interpret them is lacking it is probable that they are similar for similar reasons.

Such curves are often explained in the following manner; at the beginning of the exploitation of a new fishery the catch is of course low, but as more and more fishermen become familiar with the most suitable techniques for catching their prey, as more and more of them enter the fishery, and as they discover the best fishing grounds, production shoots up.

This expansion is generally short-lived in the case of organisms whose population size is rather limited, as is the case with trochus. For up until this point (the peak of the curve) the fishery has depended on stocks of organisms that have been accumulating for many generations. From this point on, the growth rate of the animal and the rate of recruitment of new individuals to the population cannot keep pace with the rate at which the old ones are being removed from the population by the fishermen, and the real production, which is measured in catch per unit of effort, begins to fall.

Trochus divers at Helen Reef, 1956.



Size/frequency measurements made on the Truk and Palau trochus catch show that there is a much higher proportion of older individuals in the Palau population.

It is from this point on that we may assume that our curves show what is happening to the population size. If sound conservation measures have been instituted, production does not continue to fall, but will level off at some equilibrium point. An equilibrium point is a level at which recruitment will balance the rate of removal. The yearly catch will now be fairly stable, although environmental fluctuations can cause ups and downs in the population size, which are usually relatively minor, but in some cases may be rather severe. There is reason to believe that the trochus catch at Palau and Ponape is now at, or approaching, equilibrium. Thus it seems that in areas where trochus is newly introduced we might expect the same sort of production curves if conditions are similar to those described above.

The problem of the equilibrium catch has intrigued fisheries biologists for years, and it has gradually become evident that much can be done by man to adjust this equilibrium to the most profitable level. He can, by manipulating the fishing regulations, drive the equilibrium level either up or down.

The size of a population of trochus depends on the rate of fishing, and this as a mortality factor determines to a great extent the age distribution of the stock. This in turn affects the total number of eggs spawned, since a large trochus (4½ to 5½ inches) produces many more eggs than a smaller one (3 to 4½ inches). If we have more eggs produced we will have a better chance of getting more larvae, juveniles and adults.

This process cannot go upward indefinitely, however. Sooner or later we

(Continued on page 26)

Coconut Research Outside The South Pacific (1)

This survey relating to improvement of the coconut and coconut products in the South Pacific region is the outcome of recommendations made at the Third South Pacific Conference, held in Suva last April, and the immediately-following (fifteenth) session of the South Pacific Commission.

By E. J. E. LEFORT*

The perfect crown. A 15 - year - old palm on Rangiroa Atoll, Tuamotus.

THE South Pacific, a region of sun and water, is specifically suited for the production of copra, and it is this resource which should be rationally exploited to cover not only the needs of the native peoples but also to satisfy in part those of the metropolitan countries which administer it.

The output of plantations in the South Pacific, whether European or native, is at present negligible. The solution to the problem does not lie merely in increasing the areas under cultivation, but in a change of methods directed towards obtaining increased production per unit of area.

It should be emphasised that the era of "production at any cost" is now past, and that our future efforts should be concentrated on more advanced techniques. Improvement of output and products implies not only attention to the soil and manpower, but also reduction of production costs and development of markets. This result is to be achieved through selection, control of pests and diseases, improvement of agricultural methods, use of fertilizers and modernisation of technological methods.

In the past, agronomic and technological problems have only too often been approached empirically in the South Pacific and it is now urgent that they be re-considered honestly and objectively. The sole requirements are, in our opinion, technical skill, organization and will-power.

In the course of this brief review it is not our intention to develop at great length the technical aspects of coconut research undertaken outside the Commission area, but merely to indicate the broad lines of investigations under way in this field in certain countries such as Ceylon, India, Malaya, the Philippines, Africa and the Caribbean. This survey will represent, in fact, the sum of research work undertaken in these different areas, thus making it possible to distinguish more clearly what is actually being done towards coconut improvement in the South Pacific from what needs to be done. The approach will, however, become increasingly analytical when we consider certain research which is needed with particular urgency in the South Pacific.

For the sake of simplicity, research will be classified under two general headings: agronomy and technology.

AGRONOMIC RESEARCH

Only in areas where agricultural research has been instituted and developed has tropical agriculture become prosperous. Emphasis will therefore be placed on certain branches of agronomic science which are, in our opinion, essential to the rational production of copra.

Genealogical Selection

This type of selection is practised by means of artificial cross-fertilization. It has the advantage of making it possible to attain certain pre-defined aims such as:

- increase of the number of nuts, their size, copra and oil yield;
- resistance to disease and insects, wind, intense salinity, button-shedding;
- precocity index;
- quantity and quality of the coir fibre, etc.

The per-acre yield of oil depends on two factors—the oil content of the albumen, and the quantity of copra per unit area. Both vary considerably according to variety, and the latter often fluctuates

* Research Officer for Economic Development, South Pacific Commission.

Breadfruit thrives among coconuts, and does not seem to interfere with the growth and productivity of the latter. This photograph shows two excellent inter-planted breadfruit trees and a high-yielding palm, near Mant River, Matolanim Plantation, Ponape, Caroline Islands. Giant taro is also successfully grown under the palms on the same land.

within the same variety. Nevertheless, these two aspects should be at the base of any selection work directed towards increasing production.

Cross-fertilization can often be used to obtain the effect of heterosis (hybrid vigour) which results in a vigorous phenotype and also in earlier and more abundant flowering and development than in the parent palms. For instance, in Ceylon, by crossing a tall variety with a dwarf variety an F1 hybrid was obtained possessing the physiological vigour of the first parent, size and composition of the nuts included, together with the early maturing qualities and abundant fruit of the second.

It is obvious that results can be obtained from natural crossing, but in this case the F1 generation is extremely heterogeneous, and it is difficult to extract hybrid types. To remedy this drawback it is necessary, in relation to the resemblance of the hybrid to one of the parents, to castrate the male or female flowers of the hybrid according to whether it is to be selected as female or male parent.

For instance, in the case referred to above, the hybrid resembles the tall palm, selected as female parent, and if the latter is emasculated the progeny will comprise two types: the small ones belonging to the dwarf variety and the tall ones representing the desired hybrid. Without castration, the category of tall palms would be made up of hybrid progeny and direct progeny from the so-called tall variety, a mixture from which it would be difficult to select the palms required.

The reason for emphasizing this point is that genealogical selection is a costly and lengthy business, which could be partially simplified by research into the orientation and control of natural cross-breeding. If it were possible to obtain tangible results in this field, the benefits afforded would be not only financial but also practical, since rapid satisfaction of the demand for producer hybrids would be made possible.

In order to preserve the characteristics of progeny from material obtained by the methods described above, and even by mass selection, which will shortly be considered, it is necessary to establish seed-plots sufficiently isolated to prevent the selected coconut-palms being pollinated from outside palms. It should be added, in order to give a complete picture of the situation, that the phenomenon of disjunction occurs over several generations and that hybrid purity can only be attained after repeated selection of specimen palms possessing the necessary qualities.

Mass Selection

This method is commonly employed while awaiting the results of genealogical selection and also in cases where the latter method is not utilized.

Mass selection is based on the choice of mother palms which is, in its turn, dependent on the following criteria: average age, health; length, density and orientation of the crown; thickness of stems; robustness and length of the peduncles; form, size and maturity of the nuts; the extent of yield and its duration (at least 100 nuts per palm and 250 grammes of copra per nut).

The process is completed by selection of young seedlings in the nursery, taking into account the following morphological characteristics: number, length, distribution and colour of the leaves; number of leaflets; girth at collar; quantity of roots.

The selection of seedlings to be spotted is more important than that of nuts for planting. In fact, in the case of a nut, whatever its size, the hereditary characteristics are always hidden, whereas a young palm may, according to its physiological vigour, give some indication of its future development. For instance, seedlings which sprout early bloom more

Aluminium-banding of coconut trunks for the prevention of rat-damage to nuts, at Punavia, Tahiti, Society Islands. This method of rat control has proved very effective.

Correct planting of seed coconuts. These seedlings are in the right stage for transplanting. The two in the foreground, second and third from the left, are the robust types to be selected for the purpose.

rapidly and yield more than those which sprout late; further, a young, healthy, robust specimen has a good chance, under normal conditions, of retaining these qualities in the adult stage. Such correlations have an undeniably practical character.

Selection of seedlings, which has the effect of reducing the possibility of unproductive palms in the plantation, thus increases the average production by roughly 12%.

Palms produced from mass selection, like those from genealogical selection, are always liable, according to the occurrence of disjunction, to be unstable, and it is therefore indispensable to submit the plant material to rigorous selection before setting out. According to the variations of the nursery population, this selection, which takes place at least nine months after sowing, eliminates from 20 to 60% of the seedlings for planting.

Regeneration

Before undertaking regeneration of a plantation, a soil survey is indispensable in order to discover whether its composition and fertility are suitable for restoration as such, or for change of methods of cultivation with a view to improved productivity, or whether the plantation site should be merely abandoned and transferred to more favourable land.

It is always inadvisable to regenerate a plantation without improving soil fertility. In fact, without mineral and humic fertilizers, the first fruit is formed from the tenth to fifteenth year, whereas if they are used, the bearing period commences between the sixth and eighth year.

A necessary preliminary to restoration of any sort is a study of spacing and the use of selected seedlings. It should be accompanied by mechanical or chemical weed control, and methods should be perfected for elimination of old palms by felling or poisoning the tree with sodium arsenite.

Current Methods for Restoring Plantations

Three methods for restoring coconut plantations are at present in use:

1: Planting after removal of all old palms;
2: planting, followed by gradual removal of old palms, 20% the first year and 10% the other years;
3: planting, followed by removal of old palms at the time when the young coconuts, substituted for the old, start to bloom, i.e., eight years after their planting.

The first method produces the most vigorous palms but it is not yet known whether this vigour subsequently compensates for the loss of the old palms which have been removed.

Fertilization of old palms is often profitable since quite often their apparent senility is merely the effect of undernourishment. When this has been eliminated, yield increases and the land, enriched in its turn, offers suitable ground for further regeneration.

Clearing of natural stands, which is also an important aspect of regeneration, is a field of investigation from which the South Pacific in particular might obtain a substantial rise in its present copra production.

(To be concluded)

Trochus Studies In U.S. Trust Territory

(Continued from page 23)

will reach a point where the number of eggs produced is so great that the proportion of them that find room to grow becomes smaller and smaller. At this point, in spite of all our efforts, nothing can be done to increase the size of the population. Until we reach this point the population will either increase, decrease or stabilize at certain levels, depending on the number of eggs spawned and the rate of survival of these eggs.

The problem of equilibrium catch then is not merely one of allowing trochus to grow to size large enough to allow a super-abundance of eggs to be spawned, because in this way we may be robbing ourselves of many pounds of trochus each year due to the fact that the growth rate slows down as trochus gets larger. The problem is rather one of striking a mean balance between egg production, survival, growth rate and catch. In other words, what is the highest level at which we can fish and still leave enough organisms to re-populate the stock so that this high fishing level may be maintained?

Of course, it is necessary to have a great deal of biological and statistical information to predict the level at which we can achieve this. In many cases it is perhaps an ideal which we can only hope to approximate, but, since the advantages in raising your equilibrium 10, 15 or even 20 per cent. are great, it is obviously an ideal worth striving for. It is with this purpose in mind that a rather complex series of catch statistics are now being recorded in the Trust Territory. This data, in combination with certain biological information which it is hoped will be forthcoming from this study and that being made in New Caledonia, should give us a much better understanding of what will happen in the future should we decide to manipulate our fishing regulations in an attempt to increase our productivity.

At present the Trust Territory Code limits the taking of trochus to any 14-day period during the months of May, June or July. No trochus may be taken that are less than 3 inches in diameter. These regulations are a hold-over from Japanese times, and have apparently served to maintain the Palau and Ponape populations at fairly constant levels. However, as was pointed out earlier, the Palau population is an indigenous one, while the Saipan, Truk, Ponape and Marshall Islands populations are not; therefore they may be subject to environmental pressures which are new to them as a species and to which they have not had time to adapt themselves. Conservation measures which may serve very well to protect a natural population may not be at all satisfactory for an introduced one. The persistent downward trend of the Truk population curve is an indication that this may be true.

(Continued on page 32)

Over 300 people attended the special ceremony held on Fourth International Lepers' Day (January 27) at Ducos Sanatorium, near Noumea.

Fourth International Lepers' Day

By E. MASSAL and H. CORMARY*

ON January 27 last, the people and authorities of New Caledonia took part in the Fourth International Lepers' Day.

The idea of this demonstration of charity and sympathy towards Hansenians was launched by Mr. Raoul Follereau of the Academy of Colonial Science after his first trip round the world in 1952. In the course of this journey, the "Vagabond of Charity" visited several territories in the Pacific. On his return he attempted to rally all men of goodwill to the "Battle Against Leprosy", to draw public attention to the problems of the ten to fifteen million lepers in the world today.

In 1954 only a few countries and territories tentatively organized the First International Lepers' Day. The unwearying efforts of its founder, his many journeys, the periodical *Mission de France* which he directs, the two books: *Tour du Monde chez les Lépreux* ("World Visit to Lepers"), 1952, and *Des Hommes Comme les Autres* ("Men Like Others"), 1956, which he has published, have since rendered this day of demonstration familiar and impressive; in 1956 it was celebrated in more than sixty countries or territories.

The territorial committee of the French Red Cross and the local section of the New Zealand Lepers' Trust Board organized the Fourth Day in New Caledonia. The press and radio previously broadcast an appeal by Mr. Follereau as well as two of his poems, talks by Dr. E. Massal, Executive Officer for Health to the South Pacific Commission, and by Mr. H. Cormary, Academy Inspector and Director of Public Education.

Gathering At Ducos Sanatorium

At 3 p.m. on Sunday, January 27, in the presence of Mr. Grimald, High Commissioner for the Republic in the Pacific, more than 300 persons assembled at Ducos Sanatorium. Speaking in turn, Colonel Augère, Director of the Health Department; Mr. G. Dubois, on behalf of the Red Cross; Mr. N. Daly, representative of the New Zealand Lepers' Trust Board, and the High Commissioner stressed the significance of this day and assured the patients of the concern of the public authorities, the friendliness of the peoples and the efforts of all so that lepers may be considered as "men like others".

The Third South Pacific Conference, held in Suva, Fiji, in April 1956, noted with satisfaction the work and efforts of the Commission and the measures taken by the territories to improve the conditions of Hansenians in the light of progress in scientific knowledge and the more humane attitude of communities. The Commission accepted the request of the Conference to give as wide a circulation as possible to the results obtained.

The publication of the broadcast talks by Dr. E. Massal and Mr. H. Cormary is in keeping with these desires and decision.

TALK GIVEN FROM RADIO NOUMEA, "The Voice of France in the Pacific", THURSDAY, JANUARY 24, 1957, BY DR. E. MASSAL.

On the occasion of the Fourth International Lepers' Day, fixed by its founder Mr. Raoul Follereau for Sunday, January 27, 1957, many persons will attempt to correct the false ideas about leprosy which are only too widespread, so that lepers may be "men like others".

I gladly agreed to make my contribution to this effort and, to remain in a field which is familiar to me, I intend to give you a brief summary of the present opinion of specialists on leprosy. This restatement of the question will strengthen and justify, if need be, the position taken by those who are leading the "Battle Against Leprosy".

A more accurate conception of the real contagiousness of leprosy and the success obtained in its treatment by sulphones are leading to a modification of leprosy control in endemic countries. The former conception of treatment by enforced and rigorous segregation is giving way to a more active form of treatment which respects the liberty of the patient, offering him all possibilities and facilities for treatment while, at the same time, protecting those untouched by the disease within his immediate circle.

The contagiousness of leprosy has always and in all places been exaggerated. Emphasis should be placed on its restricted and problematical nature, provided a few strict measures of elementary hygiene are observed. The contagiousness of active lepromatous forms with open lesions on the skin and mucous membranes and acute reactional episodes in some patients is recognized. But that of other forms—tuberculoid, indeterminate, dimorphous—remains questionable. Admittedly not everyone can diagnose the clinical form of the infection, but everybody should know that leprosy can only spread in places where the elementary rules of general hygiene are unknown or neglected. "Soap is the best method of prevention we possess," wrote Hansen; and Professor Jeanselme added —"Bodily cleanliness constitutes, as it were, relative individual isolation in the midst of contagion." These opinions are still valid.

The sulphones, it should be recalled, were perfected in 1937 by Fourneau, Tréfouel, Madame Tréfouel and their collaborators at the Pasteur Institute in Paris. Their use in the treatment of leprosy dates from 1941. The injectable products employed in the early days in the United States of America were replaced by D.D.S. in tablet form, administered orally.

At the present time the cost of sulphones required to treat a patient for one

* Dr. Massal is Executive Officer for Health to the South Pacific Commission. Mr. Cormary is Director of Education, Government of New Caledonia.

During the Fourth International Lepers' Day ceremonies, crowds of relatives and friends showed their sympathy and affection for patients by coming to Ducos Sanatorium. Right: The nursing sisters of the Sanatorium being presented to His Excellency M. Grimald, High Commissioner of the Republic in the Pacific Ocean and New Hebrides, Governor of New Caledonia and Dependencies.

year is less than £1stg. The action of sulphones is constant and regular. No resistance on the part of Hansen's bacillus has so far been noted. A few therapeutic reactions are the price to pay for the action of the medicine. They are generally slight and occur at the beginning of treatment only, not reappearing later. Thus all treatment should be commenced under strict medical supervision and sometimes in hospital.

Other products — thiosemicarbazones, isoniazides, streptomycine — have been utilized, alone or in association with the sulphones. Treatment with these is a more delicate operation and results are decidedly less effective.

In treating certain forms or manifestations (neuralgia and neuritis, perforations, ulcers, stiffness, etc.) physiotherapy often gives good results. The remarkable work of Drs. Barnay and Jouen in Nouméa has greatly contributed to knowledge of techniques and the value of these methods.

Methods of application of treatment by sulphones vary with local conditions. The aim to be achieved is to encourage the sick person to come freely for outpatient treatment at dispensaries or by mobile teams travelling from one centre to another. This will be attained when early diagnosis is possible and when the patient has been sufficiently enlightened to accord his active participation.

Hospitalization will remain necessary, however, for patients with an active lepromatous form, for the initial administration of treatment in cases which show a certain intolerance of sulphones and for patients with reactional attacks. The duration of hospitalization should not exceed the end of the evolutionary period considered dangerous by the physician in charge of treatment.

The utilization and value of sulphones pose two serious problems: that of the cessation of treatment and that of a cure. The diversity of clinical forms and the variety of types of development make it impossible to define standards of duration and precise criteria. Prolonged medical observation often provides a solution in particular cases. The most effective methods of procedure will gradually become clear.

The protection of healthy persons in endemic areas is no longer passive. It is no longer merely a matter of systematic isolation whose value is considered a matter of chance. Attempts are made at prevention, based on early diagnosis and treatment, isolation of patients when their condition requires it, on clinical and biological supervision of contacts, especially children, on the improvement of conditions of general and domestic hygiene. The disappearance of native leprosy in the usual European centres of infection during the Middle Ages results from improvement in living conditions, hygiene in the home and in clothing, attention to bodily cleanliness and better food habits.

For several years past the value of vaccination by B.C.G. in the prevention of leprosy has been closely studied, especially in South America. You already know that in 1954 the Health Department of New Caledonia undertook a survey in the Loyalty Islands. It is too early as yet to publish any definite results but the recent evaluation of leprosy in the group gives favourable indications. South American and French leprologists are generally agreed on the value of B.C.G. vaccination in endemic areas.

Leprosy is an infectious disease which can now be cured, particularly when patients can be treated in the early stages of infection—as in the case of syphilis and tuberculosis. This fact must be repeated over and over again until it is universally accepted.

Eradication of the disease in a territory is possible. The essential requirements are the active co-operation of sufferers and healthy persons under the supervision of a watchful health department, with the assistance of a devoted and intelligent social affairs department. Publicity should be given to the possibilities for early treatment and to the results obtained, which in properly treated cases lead to rapid recuperation of the patient. "Psychic contamination", as Merklen, Riou and Aretas call it, must be avoided at all costs. A patient who is left idle for too long quickly becomes inadaptable. From the very start of treatment, depending on the possibilities of the patient, he should be set to work or encouraged to continue his normal activities. The exact means to be employed are many, and our knowledge of them is increasing.

Prospects are very bright. Technical progress is daily providing doctors with new weapons. Social evolution is offering increased possibilities to sufferers and to healthy persons alike. The aim is the eradication of leprosy. New Caledonia is on the right road; the efforts of each individual will contribute to the final result. Give thought to it.

ADDRESS GIVEN ON JANUARY 26, 1957, FROM RADIO NOUMEA, "The Voice of France in the Pacific," BY H. CORMARY.

The organizers of the Fourth International Lepers' Day have paid me the great honour of asking me to launch an appeal to young people in favour of this

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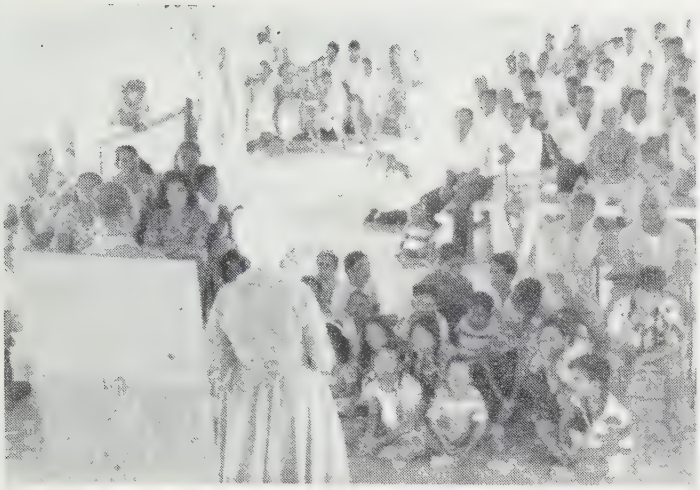

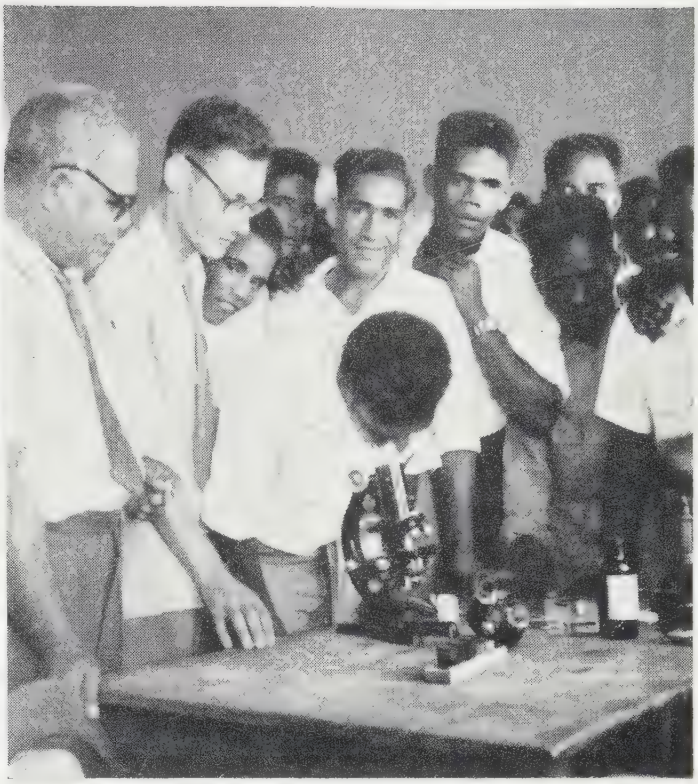

Above: Dr. Grace G. Hamman of Hawaii lecturing to Marshall Islanders on care of the eyes. Such talks are usually preceded or followed by consultations on cases. Right: Dr. Loison (second from left), co-author of the report on health education reviewed below, giving a microscope demonstration to village teachers in New Caledonia.

Health Education in the South Pacific

This review of a recently published SPC Technical Paper was prepared by . . .

T. C. LONIE*

Health Education In The South Pacific is the title of a report published recently by the South Pacific Commission. The paper, by Dr. G. Loison of the Commission, and Mr. L. L. Keyes of the World Health Organization, gives an account of the present position in the island territories of the region in relation to the important business of communicating to the inhabitants the knowledge of how to attain to healthy living, and of stimulating the desire to do so. Having assessed the state of knowledge and service existing, the authors proceed to indicate the lines upon which further progress might be made.

In the course of their survey Dr. Loison and Mr. Keyes had many discussions with representatives of the education and health services, both official and private, with those who plan and administer services, and with those who, in the course of their work, are actual health educators. Not least they saw the work in operation themselves, and talked to those in town and village to whom this work of health education was being directed.

As to the qualifications of the authors themselves, health education was a major interest and responsibility of Dr. G. Loison while he was Research Officer for Health to the Commission. He has made considerable study of the subject and is well aware of the resources in staff, methods and material available in the territories. Mr. L. L. Keyes is a professional health educator academically qualified in his subject, and is regional adviser in health education in the service of the World Health Organization. His present assignment to the Western Pacific Regional Office of WHO at Manila provides him with a field of experience and responsibility extending from the crowded active lands of Japan and the Philippines to the remote and scattered populations of the Southern and Eastern Pacific.

Basic Concepts Of Health Education

The report considers first of all the basic concepts of health education, and in doing so stresses the importance of convincing people of the attractiveness and desirability of the good practices of healthy living that are advocated. This is especially true of ideas and practices which require a departure from a previous way of life, and a change in habits which may involve additional work, care, and mental effort. The writers are alive to this, and draw special attention to the difference between merely supplying information about health, and educating people to desire good and complete health. It should not be incidentally assumed that the desire to be a Venus or Adonis of beauty and fitness is necessarily universal. Many, maybe most people, are content to live on a much lower level. The health educator must therefore not only display his information about health, he must persuade people that it is really worth having.

Again, it is necessary to see that all agencies concerned are fully aware of the importance of health education, and themselves informed on the subject. This includes not only the specific agencies concerned with health teaching as a profession or an activity of government or other organisations, but also those who are the natural leaders of the communities concerned, right down to the village level. By implication too, such village leaders and organisations must be brought in as co-partners and co-workers in the planning and implementation of the health education efforts in which their own areas are concerned.

These and a number of other points of importance are clearly made by the authors in their initial discussion of general principles.

The present stage of development of health education in the area is clearly a matter of interest, and the report gives

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Above: The health sister addresses a gathering of mothers at Saipipi, Savai'i, Western Samoa, while (right) the local medical practitioner notes some teaching ideas for later use.

in some detail an account of the arrangements operating in the territories visited. As might be expected, these are very variable in extent and emphasis, but it is important and encouraging that in none of the territories is there a complete absence of interest and activity in health education, and in some the emphasis is considerable, and the subject regarded as a basic activity either of the education system or of the general medical service, or of both. In no territory is the work left entirely to *ad hoc* or voluntary organisations, but some make more use of the services of such bodies than do others.

It is a matter worthy of some thought as to how health education may be most effectively given and organised in a territory. There is clearly room for co-ordinating committees of health and education authorities statutorily or in practice responsible for this work. To it should be added representatives of voluntary bodies and of missions, and perhaps some persons individually interested or concerned in the health education of the people, either generally or along some particular line.

The authors of the report recommend such a committee, but it should be borne in mind that the tasks and responsibilities of such a body should be carefully planned, and that it should not go beyond its duty of co-ordinating work and advising on needs to be met, or indicating promising opportunities. It should not, for instance, take responsibility for health education in schools, which is clearly the duty of the education authority. It should resist being given the responsibility for health teaching, which should be provided by the various public health departments or other regular agencies, e.g., in village sanitation, or in the education of mothers in the dietetics, etc.

It would take care to see that the teaching was uniform in content, and that there was no unnecessary overlapping. Especially it would act as a 'ginger' group to keep the subject always alive, to interest and stimulate health consciousness in the community and incidentally to cope with lethargy, disinterest and even opposition wherever arising. Nevertheless, health education is an integral part of both the education and the public health services which should work in particularly close liaison in this field, and should see to it that, in their own organisations, health education teaching is efficiently carried out.

In this respect the writers of the report draw attention to the efficient training of those who will be called upon to take part in health education in the course of their work. Clearly teachers and medical workers, especially those engaged in field work, are a very important group here.

Visual Aids

Something is said about the need for extension in the visual aids field, and special note is made of the preference that should be given to the inexpensive locally-made and locally-adapted visual aids over such things as movie films, irrelevant and inappropriate posters, etc.

The movie film has been in the past vastly over-rated as an aid in health education. It is costly to produce, it dates quickly, it does not lend itself to current or repetitive teaching in simple language, and even the unsophisticated become quickly bored with a film portraying, more often than not, a way of life entirely foreign to them, while the number of fresh audiences is in any case generally too limited to pay for the cost of a film.

The same applies unfortunately to many otherwise excellent posters. They are just not relevant. Even within comparatively short distances in the Pacific, posters may have to be varied to allow for changes in dress, food habits, and personal appearance. This is possible, however, by the use of the silk screen method of poster reproduction, which should be capable of adaptation to even quite small territories. The flannelgraph can be made and adapted locally as well.

Though the authors do not say so in so many words, it would appear that a small sectional organization could be set up in many territories for the elaboration of simple visual aids at a low cost, offset by savings in the purchase of expensive alternatives.

Practical Text Books

Attention is rightly drawn to the urgent need of practical health text books for use in the territories and having content and illustrations adapted to the country of use. Books for use both by children and by teachers are required. This is really a specialized field of work and, provided the medical details are

authoritatively approved, the task of preparing the books would seem to be one primarily for a person expert in teaching.

The report indicates that there is need for research into the application and adaptation of modern health knowledge to the ideas and environments of the various island territories, and also for the setting up of demonstration projects in health education in the territories.

Stress is laid on the correct and adequate development of an appropriate syllabus for health education teaching, and teacher training in each territory, and it is considered that the emphasis should be on practical and active work rather than on the acquiring of theoretical knowledge.

There is a point here which will require attention in some territories more than others. There appears to be a tendency in schools to expand teaching programmes to cover a number of subjects not formerly regarded as requiring such formal integration to the syllabus. Health education, whether called hygiene or by some other name, is one of these. Now in the higher grades at least, courses of education are directed to the climax of a formal examination on a syllabus whose content has usually been determined with an eye to the needs and conditions of a metropolitan country. But in respect of hygiene, the subject now under discussion, the syllabus may be completely inappropriate to the Pacific territory in which a pupil resides. This appears to be a matter which requires adjustment.

Is there then some general direction in which the South Pacific Commission may assist territories towards the attainment of satisfactory systems of health education? Dr. Loison and Mr. Keyes give us some suggestions. These have been presented to, and accepted by the Commission, which has in fact made arrangements to implement those requiring action at the present time.

WHO/SPC Co-operation

Briefly, the recommendations visualize the co-operation of the World Health Organization and the South Pacific Commission in making available to the territories in the Commission's area certain very practical assistance in the training of local personnel and in providing the advisory services of an expert in health education who could visit territories to assess the local problems and to advise on policies and methods of health education suited to local conditions.

To accomplish these ends it is proposed to hold in 1957 a training course in health education for suitable candidates belonging to the island peoples themselves. Thereafter, by visit and consultation, the health education adviser would be available for a period of two years to assist the territories. As he himself would be a member of the training course staff, he would have an opportunity of meeting island people from all parts of the area and of making preliminary acquaintance with some aspects of the problems involved. Elsewhere in this issue the purposes and organization of the training course is discussed in detail, and one will not trespass further on that subject.

It is worthwhile stressing, however, that here in the field of health, the South Pacific Commission is making a major advance in undertaking actual training and teaching of territorial health workers,

Simple filmstrips are not difficult to produce. This is part of one entitled "Soap". It was produced by the Commission to provide simple instruction in elementary hygiene.

and is doing so as a joint partner with the World Health Organization and with the further assistance of large financial support made available from the Technical Assistance Funds administered by the United Nations Organization.

Together with the FAO/SPC Fisheries Training Course just completed, this marks a major advance in the activities of the Commission.

WHO Fellowship Proposed

Apart from, but as a corollary to the local Health Education Course, and the work of the health adviser in health education referred to above, the authors of this report on health education in the Pacific suggest that in due course it may be possible for the World Health Organization to provide fellowships for advanced training in health education for suitable island candidates, who would then be fitted to undertake the responsibility for the organization and implementation of a health education programme in the territories from which they came.

It might be that the ideal would be to have two such persons from each administration, one with an educational background who could then handle the teacher training and teacher-given aspects of health education, and one with a medical or nursing background who could handle those forms of education ministered through district nursing or medical services, village organizations, women's committees, infant and maternal welfare organizations, and environmental hygiene departments.

Given an adequate background of general education, it might be that among the trainees in the Health Education Course this year there might be a few who would be suitable for this advanced professional training.

The further studies envisaged could be provided in metropolitan countries where such specialized training is appropriately developed and organized. It is, however, too early to do more than indicate these future possibilities in a general way.

Report A "Must" for Planners Of Education Or Health Policies

This report, *Health Education in the South Pacific*, by Dr. Loison and Mr. Keyes, should certainly be read by all who have the responsibility of planning or adjudicating upon education or health policies in the Pacific.

'The people's health is the people's wealth,' hackneyed though the expression may be, is none the less a true statement. Economic security is only possible to a healthy community, and can only be maintained as the knowledge of healthy living is imparted to and assimilated by the people. Among island peoples we have not yet reached the stage of development where a knowledge of hygiene and the ways of healthy living have become almost instinctive, or where the provision of community hygienic facilities may protect from the dangers which lie about us so frequently in tropical lands. It is important and essential then, that by teaching, by demonstrating, and by continued emphasis, particularly directed to the citizens of tomorrow, the ideas of healthy living should be implanted in the daily life and outlook of the Pacific peoples.

We commend this report to all who have the welfare of the Pacific island people at heart.

Fourth International Lepers' Year

(Continued from page 28)

splendid demonstration of charity.

I already had the privilege, four years ago, on the occasion of one of the campaigns organized in New Caledonia by the Local Committee of the Lepers' Trust Board, of speaking before this microphone on the problem of leprosy from the educational viewpoint.

I have little to add to the words spoken on that occasion, if not to emphasize, even more forcefully, that the problem of leprosy, although practically solved medically, still awaits a solution from the social angle.

It is therefore the responsibility of the school which, second to the family, forms one of the constituent cells of society, to deal with this problem and to give it an important place in its moral teaching.

Certainly charity, under whose sign this day has been set, is one of the theological virtues. But, as Mr. Raoul Follereau so rightly states in the work devoted to his world visit of leprosaria, this virtue, while losing nothing of its mystic value, has become, with regard to leprosy, a social rule, making it an imperative precept of secular morality. "Lepers," insists Mr. Follereau, "are men like any others, subject to the same laws and likewise protected by them. No one has the right to encroach upon their liberty or to restrict it in any way whatsoever, when they are stricken by a noncontagious form of leprosy or are in possession of a medical certificate stating that after treatment all risk of contagion has disappeared."

There could scarcely be a more decisive way of summing up the problem of re-integration of the Hansenian and more particularly the cured Hansenian, in society which, let us face it frankly, still repels him as an object, if not of horror as in the Middle Ages, at least with profound distaste and uneasy suspicion.

It should therefore be one of the tasks of moral teaching in the schools to contribute to the battle against this distaste and suspicion. It is the duty of teachers in all branches of education to participate in the efforts of organizations working towards the social rehabilitation of former sufferers. It is the duty of the young, with their spirit of enthusiasm which scorns the cowardly prudence of the adult, to enrol in this crusade of charity, whose highlight in the territory will be the ceremonies to take place tomorrow.

Certainly prejudice is deep-rooted: it dates from many centuries ago. I mentioned four years ago the passage from the celebrated play by Paul Claudel, *L'Annonce Faite à Marie* ("The Sign Given to Mary") which offers a striking illustration of the physical and human stigma which, in the century of cathedral construction attached to the leper, whether true or suspect. At the present time, as is proved daily by the achievements of the territory in the field of health, the physical stigma is no longer unavoidable; but who would dare affirm that the human stigma has likewise been banished?

It is through early training at school that support should be given to efforts directed not only towards assisting the leper medically but also to restoring him to his place in society, conquering error, prejudice and, above all, indifference to his fate after a cure has been effected.

It is the duty of the school, whatever its moral teaching, to imbue young children, the men of tomorrow, with sentiments of altruism and compassion, to teach them to devote attention, without either repugnance or hypocrisy, to the eternal problems of disease and poverty, so often, alas, indissolubly linked: may lessons of morality not remain limited to vague repetition of traditional precepts! May they be directed towards developing in the child an attitude of sympathy and understanding with regard to suffering humanity, a spirit of readiness to assist his fellow in cases where the natural reaction would be one of indifference or repulsion! What problem is better suited than leprosy to this type of active and efficient morality!

"I am a man," wrote the Latin dramatist Terence two thousand years ago, "and nothing human is foreign to me." Let us repeat to the young people listening, with Mr. Follereau, that the leper is "a man like other men", and that it would be scandalous for this human problem to remain foreign any longer to the men of today or of tomorrow.

Trochus Studies In U.S. Trust Territory

(Continued from page 26)

A further indication that there are some basic differences in the indigenous and the introduced trochus populations in the Trust Territory is that there are different proportions of various age groups present in them. For example, a relatively small proportion of the Truk catch falls into the 4½ to 5-inch category, while a much higher proportion of the Palau catch falls into this size group.

While man's fishing activities are probably responsible for this, it would seem that Palau ought to have a higher proportion of the younger shell, since it has been fished for a longer period of time. At any rate it is apparent from the Truk production curve that the population does not contain enough individuals of the proper size and age to maintain the stock at a high level of density. This may be due to factors that are entirely peculiar to Truk, however; a population in any other area, having a similar age structure and subjected to similar fishing intensities, might be able to maintain itself. Only more data of this type from other places will tell us.

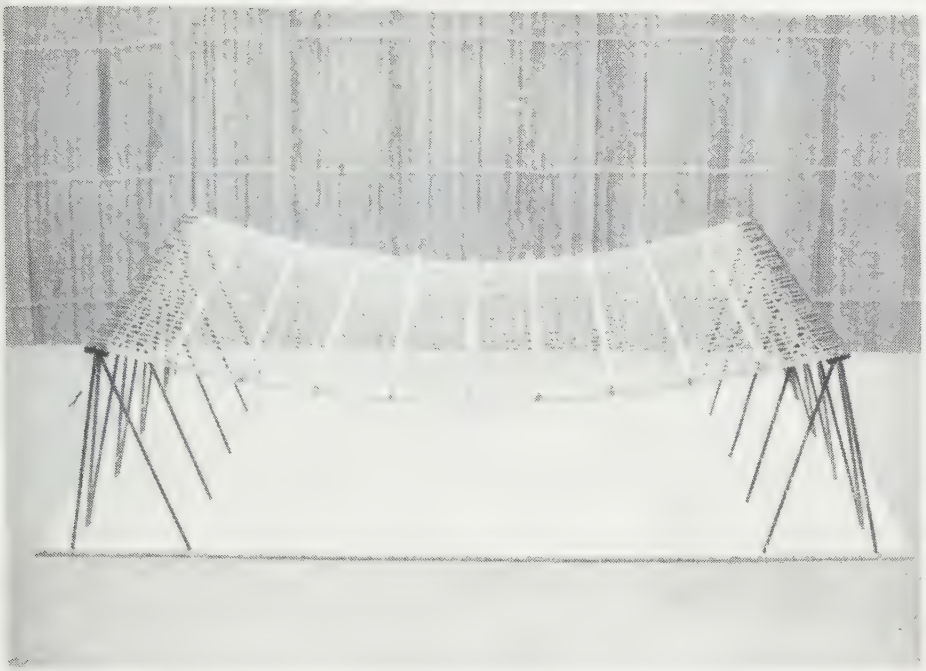
Japanese follow-up studies on the Truk introduction showed that the proportion of young shell in the survey samples changed as the population become older chronologically. In 1936, five years after the last introductions, it was found that 67 per cent. of the sample consisted of small forms (under 8 cm. base diameter). Three years later, in 1939, 52 per cent. of the sample falls into this category. It would be valuable if we had such data for a natural, undisturbed population for comparative purposes. Since this is not possible the next best thing is to compare it to an introduced population that has not been disturbed for a long period of time. Such a situation exists at Jaluit.

Trochus was introduced to Jaluit in 1939, and there has been only one real attempt to harvest it since then, in 1955. Measurements made on this 1955 catch show that only 17 per cent. of it falls into the 8 cm.-or-under category with all the rest being much larger. While these data are not adequate for describing the population's growth rate, they are indicative of the general trend.

A further indication of the trend is the "mean annual growth rate" of the Truk population. We know that by 1931 the Japanese had planted approximately 1.7 tons of trochus at Truk, and that by 1952 there was at least 220 tons in the population. Using these figures we arrive at a mean annual growth rate of the population of 610 per cent. However, it is obvious that this is only a minimum figure, for there was actually much more than 220 tons at Truk in 1952. The 220 tones figure is only the amount harvested, and represents an unknown fraction of the total population. The mean annual growth rate is merely an arithmetical, empirical description of the population growth rate but in our present state of ignorance it is useful as an index. More measurements of this nature are badly needed if we are to manage our trochus plantings in the most profitable manner.

Further critical measurements to be taken are: total size and age structure of the population, fecundity studies, rate of mortality on the larvae and juveniles, and of course growth rates. Direct measurements of some of these factors might be impossible, but approximations in combination with the other types of data discussed here should give us a reasonable chance of approaching the somewhat idealistic "equilibrium catch".

This type of knowledge will also assist us in determining suitable environments for new introductions. Preliminary surveys which have been made in the Trust Territory indicate that while adult trochus can manage to exist in quite a surprising variety of environments, it will only flourish and reproduce well in certain areas. Exactly what the important physical and biological factors are in these areas is not known, but studies are being made and it is hoped that within a year we will have at least a working knowledge of the environmental requirements of trochus, both juvenile and adult.



The structure before the roof is attached.

A simple design for

A Village School

In this article the author discusses current influences bearing on the design of buildings in the Pacific region. As an illustration of his ideas, he gives details of a simple, if unconventional, design for a village school in a tropical climate.

By TONY MOORE*

IN areas where traditional building methods are still current practice, using local materials and handicrafts economically to provide for the needs of the community, there would be every reason for continuing to build in the traditional way, unless this cannot satisfy the use for which the building is intended. Such building forms are usually a suitable response to the traditional way of life, the climate, and the materials locally available. But should the pattern change—for instance the development of reading may require more indoor light than the traditional form could provide—then the building form must change also to satisfy the new need.

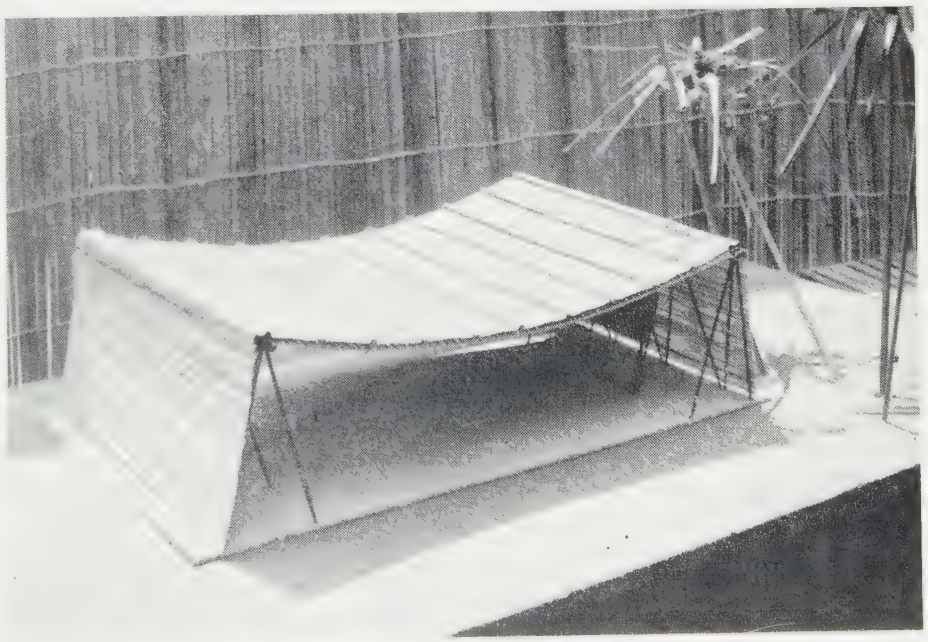
Where the local building traditions are disrupted—due to shortages of local materials or to the ready availability of manufactured products, through emulation of Europeans, or following the breakdown of local customs and techniques—then it would be wrong to copy, using new materials and methods, the traditional forms. Any worthwhile architecture is always a response to a whole complex of related factors, and should any of these factors change, the expression of the whole must also naturally change. In such cases the approach should be from first principles: consideration of human needs and activities, climate, available materials, and the many factors influencing cost. The final form of any building should follow logically from reasoning through all such aspects. This process of close reasoning does not exclude the leap of imagination, achieving a solution long before completing the analysis, but like any other solution, it should still stand critical examination and finally the hard test of experience.

Pacific in Various Stages of Transition

The Pacific area seems to be a society—or group of societies—in various stages of transition. In consequence, when European materials are used, naturally the aim is to provide a neutral building form, using the imported materials in the simplest possible way. To copy European, or any other preconceived forms, would deny the existence of those very influences which would determine the form of building. Although it may sometimes be possible to use both local and European materials together, without the result appearing incongruous or absurd, such juxtaposition needs careful consideration lest it affect the properties of a material. Thus the effective life of thatch might possibly

(Continued on page 44)

* Mr. Moore is a Public Architect in Sydney.



View from above, showing aluminium roof end screens of split bamboo.

Tri-car used by a dairyman for home delivery in Papeete. Pasteurized milk is delivered in sealed bottles.

Dairy Production In Tahiti

By MICHEL GUG

Veterinary Inspector, Livestock Section,
Department of Agriculture, Tahiti.

THE climate of Tahiti is of the wet tropical type with a characteristic temperature offering only slight variations (14.5° F either above or below the mean annual temperature of 77° F at Papeete) and rainfall distributed throughout the year, with a definite minimum in June, July, August and September, amounting to an average of 75" to 160", depending on the orientation of the coast-line in relation to prevailing winds.

These conditions are most suitable for maintaining good-quality pasture the whole year through, as is shown by the following record of yield:

Basic Pasture Plant	Annual Green Yield to the Hectare	No. of Cuttings per Year
	tons	
Paspalum Conjugatum	17.5	6
Paspalum Conjugatum .... (improved soil)	23.7	6
Melinis Minutiflora	49.2	6
Melinis Minutiflora ..... (improved soil)	70.5	6
Pennisetum Purpureum ..	61.7	9

For some time past, good use has been made of these advantages by the introduction of cattle raising; but it was not until quite recently that specialized dairy production was commenced. This step was essential as a means of meeting the growing requirements of the population, which comprises a large percentage of children (51.5% under 20 years).

Although Tahiti produces annually 400,000 litres (68,000 gals.) of milk, there still remains a gap in requirements which is covered by imports. These are admittedly lower than in former years, but they nevertheless accounted for 426 tons (milk in all forms for the whole of the territory) in 1955. This fact emphasizes the existence of a wide market for local dairy production; furthermore, such production would be profitable, since the price paid for milk to the producer is 8.50 frs. to 10 frs. per litre (approximately 6d. to 7d. per pint)[1].

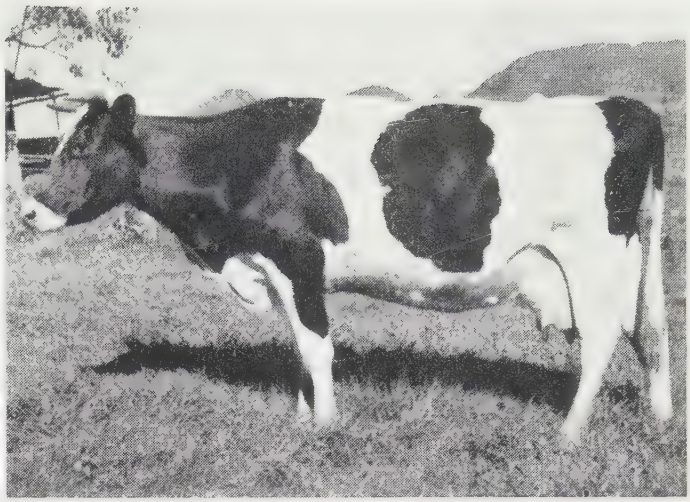
The breed most commonly used for dairy purposes is Holstein-Friesian. Imported Holstein cattle become rapidly acclimatized, although close supervision is necessary during the first few weeks; pure-bred cattle react favourably to conditions. The same is true of the Jersey breed but this is less commonly found and far less popular than the Holstein-Friesians. Various cross-breeds are also produced; their value, often most satisfactory, depends either on individual characteristics or careful selection.

Mention may be made in passing of the Zebu species, which is also raised here. Since Zebu stock introduced in the past had no particular dairy specialization, its value is limited. Furthermore, the use of other breeds having proved more than adequate there seems no reason to develop a type of Zebu for dairy purposes.

It should be noted that on the whole livestock here is characteristically small in size. Cows selected from native herds, generally for cross-breeding, are descendants of stock which frequently suffered from malnutrition and showed signs of varying degrees of inbreeding as a result of restricted space. Weight per live beast is never higher than 600 to 800 lbs. Holstein stock imported from New Zea-

[1] The retail price of home-delivered milk in Papeete is 14 frs. CFP per litre (approximately 9d. per pint).

General view of the Taravao dairy, altitude 1,150 feet. Pasture was established following mechanized clearance of bush.



Above: "Zero", Holstein-Friesian bull aged four years. Right: "Domino", Holstein-Friesian cow which produced 8,800 lb. of milk in 311 days during its third lactation.

land produces cows whose average weight at the end of six and a half years may be as high as 1,000 lbs., although even in this case no comparison can be made with the original European stock. This observation should be kept in mind in considering dairy capacity which is mentioned later in this article: weight must be taken into consideration in evaluating individual milk production.

Essential prophylactic measures are taken for the control of intestinal worms (helminths) and ticks (ixodes). Periodical dosage with phenothiazin (thiodiphenylamine) is an excellent method of restricting development of gastric and intestinal parasites. Ticks of the Boophilus type, which transmit piroplasmosis (also known as Texas fever), are controlled by dipping and spraying with D.D.T. (dichloro-diphenyl-trichlorethane) and H.C.H. (hexachlorocyclohexane) products in soluble form.

The most common disease of dairy cows in Tahiti is mastitis, which is fairly frequent in view of the absence of stabling facilities; and also localized calcic deficiency on certain soils. Chronic and insidious complaints are more common than those of an acute nature: various factors, among which a deficiency of vitamins would seem at first sight to be a possible cause, are involved. Plant poisoning remains a mystery; many cases of mortality which are hastily dimissed as the result of piroplasmosis, for instance, might well be due to this cause.

Without going into excessive detail here, let us mention that:

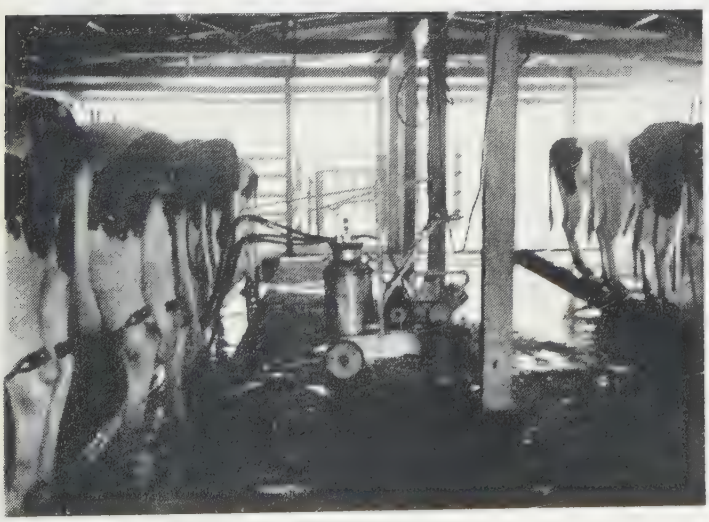
—specimens of grasses used for pasture have been tested for their cyanhydric acid content; all analyses have proved negative.

—the various varieties of cassava, a plant which is often used for animal breeding, show the following cyanhydric acid content—

white cassava: generally absent except sometimes in the phelloderm.
grey cassava: fairly common traces.
red cassava: constant traces (practically eliminated for feeding purposes).

Careful supervision of calving ensures a strict control on breeding (gestation diagnosis, sterility control) and thus permits full profit from available stock. In the best possible conditions fecundity rates of 100% have been recorded.

The animals are kept out permanently in the open air, in fenced enclosures, and they generally have access to a constant supply of water. They are assembled for milking in special sheds which are well aired, have cement floors, and comprise one or two rows of stalls with troughs for distribution of the supplementary food ration.



Above: Milking-shed at Pirae. The cement floor facilitates cleaning. A drain (visible on right) collects droppings. The premises are completely enclosed with wire-netting to keep out stray animals, poultry, etc. Right: Note the system for separating the cows, and the tip-up troughs which facilitate cleaning after they have consumed their supplementary ration.

Most of the Taravao herd is machine milked, then hand stripped, twice daily.

Milking is carried out either by hand or machine (in the case of 60% of milch cows) generally twice a day. Mechanical milking is followed by thorough stripping by hand, to prevent retention of milk and its possible consequences.

Milking machinery is thoroughly washed by rinsing and brushing several times; it is advisable to fill the pipework with a chlorinated solution when not in use. These two hygienic measures must be observed if the machinery is to be used rationally.

The animal breeding and trial station at Taravao, which supplies selected sires to a number of holdings, has produced the following data with its pure Holstein-Friesian herd, based on monthly records of dairy production figures:

Average production per lactation—5,553 lbs.

Average duration of lactation—285 days.

These data are based on 50 cows with at least two lactations on record. Since no allowance was made for age and no special selection undertaken for the purposes of the test, the production figure of 5,553 lbs. is an *accurate* indication of the true average dairy production. A glance at individual records shows that a number of cows provide over 6,500 lbs. and sometimes even more than 8,820 lbs. of milk in one lactation.

According to a survey carried out in 1954 and covering all dairy holdings in Tahiti, the average yield of milk would appear to be 35 gallons to the acre.

Milk composition was also studied and the following analyses can be considered as average:

Density	1,031	
Dry extract	124	grams per litre
Fats	40	grams per litre
Calcium	1.18	grams per litre

The fat content may be considered as satisfactory, since analyses were carried out on milk from Holstein cows.

Selection of breeders, based on dairy records and proper conformation in the case of the dam, is exceptionally important in the case of the sire, for experience has shown that a high production capacity is more likely to be transmitted through the male than through the female.

A check on progeny defines the value of a bull in terms of the value of its direct female descendants in relation to their dam; the criterion, it is understood, being that of high dairy production. A long-range operation of this kind can be undertaken only in a fairly well-stocked area; in the present state of stock-raising in Tahiti, this possibility is out of the question. Supply of selected sires therefore remains a necessity.

Technical progress in the field of artificial insemination gives hope that this method may be used. It has, in fact, been found possible to preserve semen at a temperature of —46° F., in carbonic acid, for over a year. An insemination centre might therefore be conceivable, periodical supplies being received from a station using advanced selection methods, even if it were situated at a very great distance.

Supplementary Ration Needed

The basis of animal feeding is pasture. This matter will not be considered further here since it has already been dealt with elsewhere.[2] A production ration in excess of this is required for dairy cows. It is distributed at milking time and generally consists of cassava, crumbled fodder or copra cake. Cassava gives a high energy supply (0.5 fodder unit per pound), especially in periods of drought. Copra cake is an economical way of providing proteins (about 6d. per lb. for an average of 80 gr. of protein); the quality of these proteins is not, however, of the very best from the nutritional viewpoint.

A typical daily ration is made up as follows:

Cassava	13 lbs.
Copra cake	4 lbs.
Green fodder	27 lbs.

As a further means of keeping as much of the milk produced as possible for human consumption, artificial feeding of calves has been tried out. This is commonly practised at the present time in several holdings and generally gives good growth results. The method used consists of feeding the calves with cow's milk till the age of 15 days and gradually replacing up to two quarts of milk with an equivalent amount of milk substitute so that, by the time it is two months old, the calf is nourished entirely on the latter.

Future work programmes should include further investigations into supplementary feeding, the problem of storing food (silage, etc.), which is not practised at present, and should also develop forage crop production. Finally, pasture land which has already been analyzed requires further study (trials on fodder plants, ley farming, various supplements) likely to promote permanent improvements, experimental procedure being based on the twofold criterion of floristic analysis and yield in terms of weight.

The matter of pasture is a very important one with regard to the raising of cattle, both for dairy purposes and for slaughter.

The trade circuit followed by milk in Tahiti consists of collection, processing in some cases, and distribution. Local producers close to Papeete transport the milk by their own methods. A daily collection is made between Papeete and the peninsula of Taravao by way of the west coast of Tahiti. For this purpose an isothermal ice-cooled van with a temperature of approximately 50° F. is used.

Milk Distribution Procedures

A single pasteurization plant is at present in operation; the low-temperature method is used (the milk being heated at approximately 142° F. for at least 30 minutes, followed by refrigeration). It is delivered in sealed bottles containing one pint or one quart. Quality is checked regularly (pasteurization graphs — biochemical methods—evaluation of microbial flora). Of the total quantity of milk consumed, 42 per cent. is pasteurized (1955).

The utilization of fresh milk gives rise to the problem of preservation, which is especially difficult in tropical countries. In normal conditions heating is the best possible solution. Pasteurization is particularly to be recommended, both for preserving the milk as well as for maintaining intact certain of its nutritional qualities.

The centre of consumption is Papeete and its suburbs. Milk can be obtained from a number of retailers but a large quantity is delivered to individual homes by these same tradesmen. This is necessarily the case in the outer suburbs.

(Continued on page 56)

[2] H. S. McKee—"Dairy Farm Successfully Established in Tahiti", **Quarterly Bulletin,** South Pacific Commission, April 1956 (Vol. 6, No. 2).

Small ships unloading copra at Madang, New Guinea.

Small Ship Safety In Pacific Waters

Strewn with reefs, many of them uncharted, with strong unpredictable ocean currents a commonplace, and with lighthouses and other aids to navigation few and far between, the Pacific Ocean is the most dangerous in the world for small ships. That this is so is demonstrated by the tragedies that occur from time to time. Many of these could undoubtedly be prevented if the suggestions for safety measures made below by the author were adopted as standard for all small ships plying Pacific waters.

By ARTHUR N. SWINFIELD*

THE many islands of the South Pacific have been and still are linked together by the equally numerous small craft that ply between them. Some maintain a more or less regular time-table, but the majority come and go as circumstances dictate.

As a one-time builder and now designer of some of these craft, and as a traveller from time to time in many of them, it has often crossed my mind that the work done by such craft has been of the greatest importance in developing the South Pacific, and that this aspect of the "island pattern" is oft times taken for granted—and to some extent discounted because of the relative smallness and humble appearance of the vessels involved.

The crews of these vessels are in most cases excellent "natural" seamen, and the many tales of their ingenuity speak for themselves. Their courage is undoubted and, when one considers the immensity of the South Pacific and the dangers that beset any navigator in tropical waters (qualified or otherwise), this courage, so often taken for granted, is of no mean order.

However, from time to time tragedies occur, and it is then that more than local attention is focussed on the problem of inter-island small ships. It is with a sincere desire to improve these vessels and to preserve them and those who sail in them that this article is written.

It is, no doubt, generally known that when a small ship leaves Australia for an island destination it makes such a voyage under "permit" from the appropriate authorities. This "permit" is not loosely given, and every vessel is subjected to a survey which is intended to safeguard the vessel and her crew whilst en route to her destination. However, once the vessel reaches her destination, or the port of entry at such destination, she then comes under the attention of whatever authority controls local shipping.

For "the trip over" a qualified master and engineer are essential (among other personnel depending on the size of the vessel), and these men ensure that, in so far as their knowledge is concerned, everything is in sea-going order. These endeavours, coupled with those of the surveyors, are qualified, practical, and seamanlike and in almost every case the small craft arrives at her destination after just another "island delivery job".

And now the vessel is "in service", and "in service" in one of the worst areas for a small craft in any part of the world.

The waters abound in reef, teredo (borer), the climate is humid and tropical, repair facilities relatively few, and the usual aids to navigation, such as lights, etc., few and far apart. All these and the actual effect of the tropics on human endeavour add up to hazards which demand attention constantly on the part of some one who must or should know what it is to operate small craft in these waters.

In the case of a brand-new, well-designed and faithfully built vessel the owners have some chance of "starting off on the right foot" provided care is taken to ensure proper maintenance, where maintenance really counts. But in the case of second-hand vessels, particularly those "converted" for island usage, it is not so easy to instill the necessary knowledge and enthusiasm into those who are responsible for the proper maintenance of the vessel.

It is not sufficient, for instance, merely to keep any vessel's upper works and decks clean and the engine polished, in sundry places. The things that *do* matter are not always known to the crew, let alone the owners, so that the vessel itself suffers from a lack of maintenance.

But this is in itself not so serious provided the ship carries the means to save the lives of those who travel in her—and it is here that a real problem occurs. The ships in question are small, the crews usually numerous and passengers, if any, just as numerous. A dinghy (or in some cases a lifeboat) is admittedly always carried, or in many cases towed (for short journeys).

However, when the small craft leaves Australia on her trip across to the islands, she must be equipped with an "approved" dinghy which is one that can accommo-

* Mr. Swinfield is an Australian naval architect. His services were made available by the Food and Agricultural Organisation as a lecturer on boat building and marine engines at the recent SPC Fisheries Training Course.

Students attending the recent SPC Fisheries Training Course listening to the author (standing inside hull) lecturing in a Noumea shipyard on the design and construction of small craft.

date the crew in the event of "trouble at sea". The delivery crew would naturally have been a minimum one, in order to make delivery charges as reasonable as possible, so that the dinghy or boat usually becomes a still more minimum capacity dinghy "in service".

The vessel in question would also be equipped with lifebuoys and lifebelts also sufficient in number for the delivery crew —and these are, in most cases, supplemented by the appropriate authorities in charge of the vessel in her home waters.

But when serious trouble occurs (and it does from time to time), this inadequate gear is all that is "theoretically" available to those in trouble.

The word "theoretically" is used because in many cases "the boat" is not in a fit state to operate as a lifeboat, and the rest of the life-saving gear is "stowed away" in relatively inaccessible places and in many cases is unserviceable—due to the ravages of mildew, cockroaches, etc.

Many Safety Measures

Well now, perhaps such things are in fact true, so what? What can be done to rectify some of them—and lessen the risks of the others? May it be suggested that one or two things could perhaps be done, but done successfully only with the full co-operation of all concerned?

A few of the more important aspects are listed below:

1. Life-saving equipment should be brought into line with the type of boat in question.
2. Crews should be trained in boat management, general maintenance, elementary boat-building, engine maintenance, cleanliness and fumigation.
3. Select crew members should be trained in elementary navigation.
4. Select crew members should be trained in first-aid and fire fighting.
5. Select crew members should be trained in the elementary principles of stability and trim.

Item 1 is one which needs a great deal of attention and understanding by all concerned.

Items 2-4 could be organised by means of suitable lectures.

Item 5 could be demonstrated on board any suitable vessel.

Perhaps the very idea of training sounds out of the reach of ordinary boats' crews. But as a technical teacher of native people (Papuans) for many years—and as a more recent lecturer at Noumea, I am convinced that such ideas are quite sound and that complete success would be assured.

However, a start must be made and it is suggested that now is the time.

The question of life-saving equipment is one for consideration by the various island authorities themselves, and it is suggested that the time is ripe for a complete survey of the present facilities. It is not suggested that boats as life-saving equipment should be entirely discounted, but their real value is perhaps sometimes over-estimated.

Carefully-designed rafts could be used as supplementary life-saving equipment and, with the aid of present day modern materials, this would be a very worthwhile contribution to the life-saving equipment of any small vessels.

It is not the purpose of this article to set out any dogmatic views in regard to any aspect of small-ship operation; rather is it to draw the attention of all those vitally concerned with small island vessels to questions that need full investigation by competent investigators.

Papua And New Guinea Exports Increase In 1955-56

PRELIMINARY figures for 1955-56 exports from Papua and New Guinea reveal an increase in value from £A12,886,000 (1954-55) to £A13,258,-000. The increase has occurred despite the price reductions for a number of important territory products which reflect current world price trends, and the smaller quantity of gold produced from the declining gold fields.

The major products which showed a decline in prices but increases in quantities produced were coffee, cocoa, and coconut products.

The drop in earnings from coconut products resulted from the reduced price under the long-term contract with the United Kingdom. (The reduced price is, however, still above open market price.) Because of an increase in production of nearly 5%, the amount earned by the coconut industry fell by only £A.180,000 to £A.7,644,000.

Gold production fell by 17% in quantity, and only £A.1,073,000 was earned last year. There was a slight increase in cocoa production from 1,106 to 1,281 tons, but as a result of a major price decrease the value of exports fell from £A.526,000 to £A.361,000.

There has been a large increase in the export of sawn timber (from 2.9 million to 3.9 million super feet), while slight increases have been recorded in the quantity of logs, veneers and plywoods. The value of all timber exports increased by £A.150,000 to £A.1,052,000.

There has been an increase of both quantities and values of the various forms of shell exported from Papua and New Guinea. This commodity earned £A.442,000 last year.

There has been a major increase in the value and tonnage of rubber exported—from £A.954,000 to £A.1,391,-000.

It is officially stated that these trade figures are not comparable with statistics published previously, as they were compiled on a new basis in which imports and exports were valued at F.O.B. values. Previously, both imports and exports were valued on a somewhat higher "value for duty" basis, which was found unsatisfactory.

WHO Adviser Praises Health Campaign

The Adviser of the World Health Organization, Dr. D. R. Huggins, has praised the recently-completed anti-yaws campaign of the Netherlands New Guinea Medical Service. He said that the campaign, which had lasted two years, had been carried out with great efficiency and excellent results. Over 310,000 Papuans have been treated with penicillin since the beginning of 1955. This campaign will be followed by another in remote areas.

The new 160-bed tuberculosis hospital on Guam.

Tuberculosis Control On Guam

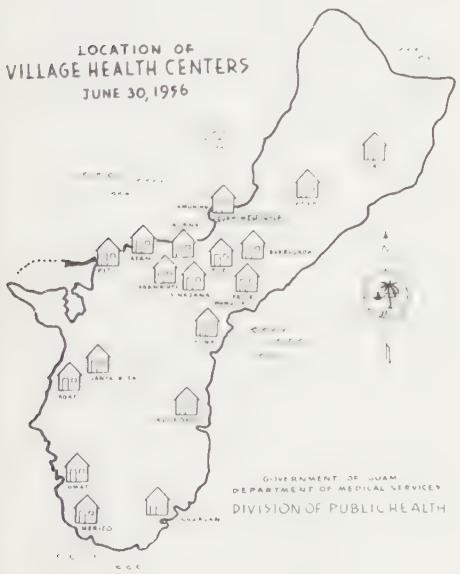
By NIELS H. POULSEN

Chief, Division of Public Health, Department of Medical Services, Guam.

BECAUSE of its isolated location, and since Navy clearance is compulsory for all travellers to and from Guam, this Pacific island presents an almost ideal place for the establishment of a tuberculosis control programme with a fair chance of success.

Since its discovery by Magellan in 1521 Guam has been the focus of influence from many parts of the world. The first Spanish missionary who landed on Guam described the native Chamorros as a strong and healthy people, and estimated the population to be about 70,000 souls — a tremendously high population for an island of only 225 square miles of which a rather big part consists of mountains and coral rocks unfit for agricultural development.

Certainly, with a population of more than 300 capita per square mile, no serious epidemics or communicable diseases could have been in existence on Guam in ancient times without having limited considerably the size of the population.



Unfortunately the Spanish not only brought Christianity with them but also smallpox, tuberculosis and other diseases. Through the influx of war, spread of tuberculosis, and epidemics of smallpox during the next two centuries, the population was decimated to such an extent that in the beginning of the 18th century only 1600 Chamorros, mostly women, had survived.

The permanent civilian population has now increased to 38,000, of which about 32,000 are native Guamanians originated from the Chamorros but mixed with Spanish, Filipino-Malayan, Japanese, Chinese and in the later years also some American blood. The last 6,000 are mostly state-side Americans employed by the local government or in private business.

The military personnel, civil service and their dependants and hired labourers, mostly Filipinos, constitute an even larger, constantly-changing group of people under military jurisdiction and medically under the care of the military medical authorities. Due to scrutinous control before the arrival on Guam, tuberculosis is practically non-existent in this last group, and when occasionally found the patient will as a rule be sent to the mainland and will therefore not figure in our statistics.

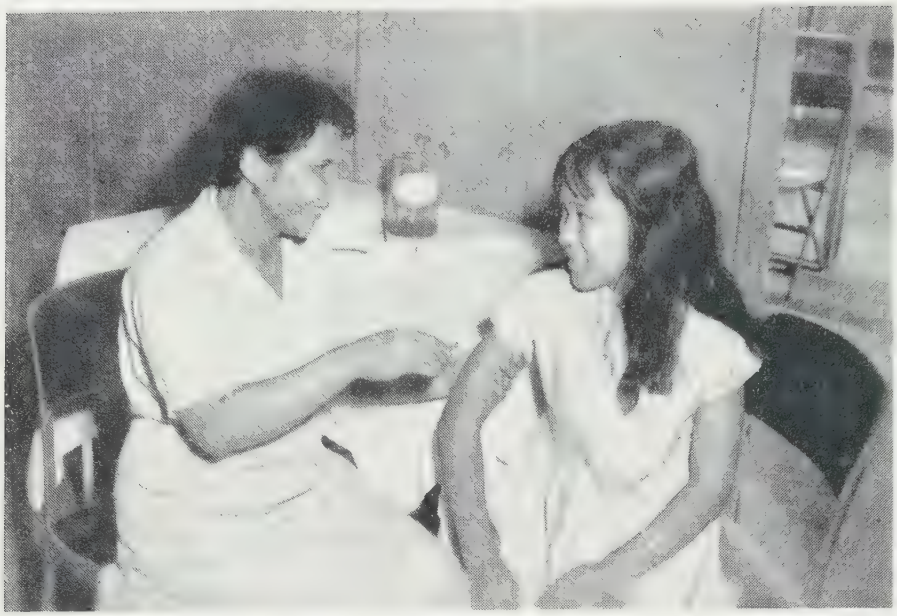
Our tuberculosis control programme is therefore mainly aimed at eliminating tuberculosis among the native Guamanians where tuberculosis still is a major public health problem.

With the introduction of the three big drugs: streptomycin, para-amino-salicylic acid (PAS), and isoniazid (iso-nicotinic acid hydrazide), the mortality of tuberculosis dropped drastically in the United States. In the last few years, however, the decline has been slower, and it seems that the modern treatment of tuberculosis at present has reached its maximum effectiveness as to prevent death of tuberculosis, and an increasingly high number of patients will develop strains of tuberculosis bacilli resistant to the modern drugs.

In many cases modern therapy will be able only to prolong the life expectancy of the patient but not to completely arrest his disease to a degree where he does not constitute a potential danger of infection to his surroundings if not constantly under medical surveillance.

In Guam the decline in the death rate of tuberculosis has been still sharper than in the United States (see graphical representation), but our experience here also points in the direction that modern therapy, including drugs as well as surgical procedures when indicated, will not be able to eradicate the remaining and still too big tuberculosis problem.

This theory is firmly supported by the fact that the morbidity, the incidence and prevalence of tuberculosis has not dropped nearly as rapidly as the mortality rate, neither in the United States nor on Guam. In the United States the mortality rate dropped 56 per cent. in the period from 1952 to 1954 compared with only 8.2 per cent. in the incidence of new reported cases. In Guam there were still 119 new admissions of active pulmonary tuberculosis to the TB hospital in 1955.



A district nurse performing a tuberculin test on one of the 15,000 school children who will be tested and vaccinated against tuberculosis.

Although this is a drop in the incidence of new reported cases, this figure is at least 5 times as high as in the mainland per 100,000 population, and even if death from tuberculosis has dropped from its leading position as the number one killer on Guam to a minor position far below cancer, pneumonia and accidents, the prevalence of this disease is still so high that it causes more sick days and constitutes a bigger economic problem than any other communicable disease.

These facts made us realize that a more rigid preventive tuberculosis programme was indicated.

B.C.G. Vaccination Programme First Step

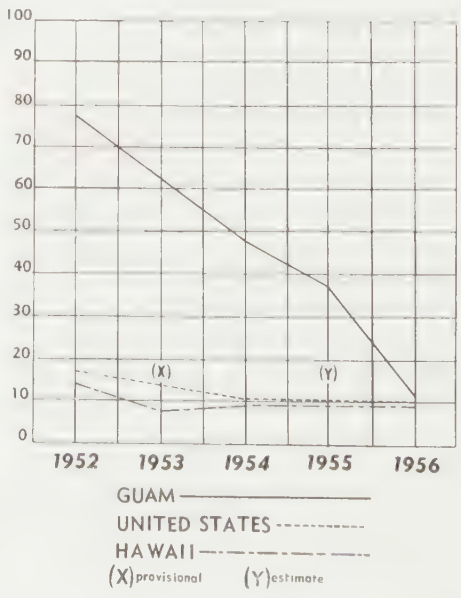
The first step was the introduction of a B.C.G. vaccination programme in April 1956. The programme is aimed at vaccinating:

1. All newborn babies when they are two days old.
2. All school children, starting at the first graders.
3. All contacts of tuberculosis patients.
4. Other groups especially exposed to tuberculosis such as hospital and public health personnel and teachers.

All the Public Health district nurses were trained in the tuberculin testing for which it was decided to use Old Tuberculin (O.T.) in the concentration of 1 : 100. Recent research work (e.g., the South Pacific Commission, Research on Tuberculosis, 1950) has proved that this test is superior to the commercial Purified Protein Derivative (PPD) available in this part of the world, and that a correctly performed test with this high concentration of O.T. will be positive in almost 100 per cent. of cases with active tuberculosis.

All cases who show a positive tuberculin reaction will have a chest X-ray to evaluate whether or not they have active tuberculosis, and active cases will be admitted to the Tuberculosis Hospital. All negative cases will have their B.C.G. vaccination for which we use deep frozen B.C.G. vaccine from the Research Foundation, University of Illinois. The vaccination is performed with the multiple puncture disk method as developed by Dr. Sol Roy Rosenthal.

GRAPHICAL REPRESENTATION OF TUBERCULOSIS MORTALITY RATES PER 100,000 FOR GUAM, TERRITORY OF HAWAII AND THE UNITED STATES



Medical Director of the Research Foundation. Eight weeks after the B.C.G. vaccination a re-test with O.T. will be given to all who received vaccination and those who are still negative will be re-vaccinated.

The X-ray mobile unit consists of a General Electric X-ray equipment for 70 mm chest X-rays, installed in a truck with space for an X-ray technician, a small office for the nurse and dressing room for patients. Efforts are made to work out a schedule to send the unit to each of the seventeen districts of the island once a year. The nurse will contact the local Commissioner (Chief of the village or district) and a committee will be made who will be responsible for getting *all* inhabitants of the district to have a chest X-ray, free of charge.

Competition is encouraged between villages to obtain the best results in the different districts where the X-ray mobile unit has already been. So far the percentage of population who had an X-ray varies from 70 to 85 per cent. In the High Schools it is hoped to get 100 per cent. of the students X-rayed.

The films are read by the radiologist of the Health Department. In all doubtful cases, he will request the patient to come to the hospital for a re-take of a 14 x 7 inches film and for further evaluation.

All persons who apply for Food-Handler Certificate (food-handlers, restaurant personnel, people working in bakeries, butchers, etc.) must have a chest X-ray once a year. The aim is that Guam shall be the first territory in the United States where all the population has had a chest X-ray.

Up till now approximately 3,000 persons have been tuberculin tested and/or B.C.G. vaccinated.

Re 1—*New-born Babies*: More than two-thirds of all babies in the civilian Guamanian population are born in the Guam Memorial Hospital, and it is the duty of the nurses in the Obstetrical Department to perform the vaccination against tuberculosis in the second day of the baby's life after a written permission from the parents has been signed.

This permission is given in almost 100 per cent. of the cases, and no complication whatsoever has occurred until now from the vaccination. If there is any known case of tuberculosis in the family, the baby will be isolated at least 8 weeks or until turned tuberculin positive.

The mid-wives will report to the dis-

(Continued on page 42)

Clearing House Service For Pacific Broadcast Recordings

With the main object of increasing the amount and variety of material available for broadcasting by Pacific island radio stations, the South Pacific Commission has instituted a special service for the interchange among them of island recordings.

Natives hold a special sing-sing in their ceremonial grounds at Palimp Village, near Mount Hagen in the Western Highlands of New Guinea, to celebrate the Moga ceremony, a very complicated system of "gift" exchange practised by the people of this region. It involves a system of loans and exchanges of pigs, pearl shell, produce, etc. The opening phase of the ceremony shows those bearing mother-of-pearl shell leading the chanting warriors.

THE music of the Pacific Islands is almost entirely unknown in other parts of the world because little has so far been done to preserve and record it, except by a few anthropologists and other research workers.

In Africa, India, Indonesia, in fact in most other areas, indigenous music has been recorded by commercial companies, the records are broadcast on local stations and are available for sale to the people, and local composers and performers are encouraged. But in the Pacific, the islanders can usually only hear and buy recordings of European or Hawaiian music, which have little relation to their cultural background, while their own music, which is full of charm and variety, is largely neglected.

This lack of Pacific islands music has become more obvious in recent years, with the expansion of broadcasting in the area and the provision of special sessions for island listeners.* One of the biggest problems facing the organizers of native people's radio sessions is the shortage of suitable programme material, because recordings of local music are almost non-existent.

Clearing-House Service Requested

No doubt it was these facts which prompted two administrations to ask the Commission to provide a clearing-house service in the field of Pacific islands music. The Research Council at its 1953 meeting therefore recommended that a clearing-house service for Pacific broadcast recordings should be established to which Pacific broadcasting stations should be invited to contribute to a "pool", local recordings (on disc or magnetic tape) of songs, dances, talks, etc., which would then be made available for the Commission for loan or purchase by other island stations. The report of the meeting stated that—"in addition to its educational value the service will increase regional knowledge and understanding and serve to bring the islands closer together". The Research Council's recommendation for this new service was approved by the Commission at its session held in October 1953.

During 1954 and 1955 preliminary work was done on the organization of the service by the social development section. Advice was obtained from metropolitan broadcasting stations (especially the Australian Broadcasting Commission and the New Zealand Broadcasting Service) and commercial recording companies, the question of copyright was examined, and by mid-1955 it was possible to give an outline of the scheme to territorial broadcasting stations and other interested organizations. Most of the territorial officers concerned with broadcasting were enthusiastic about the proposed service, and some of them contributed recordings to the "pool".

At the same time further enquiries were being made into the technical and financial aspects of the service, and certain alterations were made to the original proposals. It was decided that tape recordings contributed to the clearing-house would be re-recorded on tape and sold to broadcasting stations in that form. The making of discs from tape recordings received would have to be postponed for financial reasons until the service became firmly established. A new tape recorder of broadcast quality was ordered by the Commission, and arrangements were made for re-recording to be done by a qualified engineer.

Special Catalogue Issued

When a sufficient number of recordings had been received from various sources, a detailed catalogue, together with instructions for users of the service, was prepared in the form of a Technical Paper (No. 93). The English edition was distributed to Pacific and some metropolitan broadcasting stations in November 1956, and the French edition is being distributed to the French territories. The catalogue lists about 50 discs (from Papua-New Guinea and the British Solomon Islands Protectorate) and about 40 tape recordings (from the Cook Islands, American and Western Samoa, the British Solomon Islands Protectorate and the Gilbert and Ellice Islands Colony).

Most of these recordings are of music, but they include a number of tape recordings made at the Third South Pacific Conference in Suva in April 1956. There is also a section of the catalogue devoted to commercial recordings of Pacific islands music; over 20 discs, mainly of Tahitian music recorded by two French commercial companies, have been located so far. These recordings are not

* An article in the October 1956 issue of the **Quarterly Bulletin** described developments in Pacific broadcasting.

available through the clearing-house service, but it was thought that broadcasting stations would be interested to have information about them.

Many Attractive Items

Many of the recordings contributed to the clearing-house are very attractive, quite as good as the better-known Tahitian and Hawaiian commercial discs. They are not all genuine traditional songs—they often show the influence of hymn tunes and of Western popular music, and many of them use modern instruments such as guitars and ukeleles for the accompaniment. But they are the songs which the islanders themselves like to sing and hear, and the recordings will, it is hoped, help to meet the demand for Pacific broadcasting stations for programme material related to the islanders' cultural background.

On the other hand the catalogue also contains material of interest to the research worker in the field of primitive music. For example, many of the discs contributed by the Administration of Papua-New Guinea consist of traditional ceremonies and dances, which were recorded in the field by territorial officers.

The present form of the service must be regarded as only the first, experimental stage of a wider project. Eventually it should be possible to interest a commercial company in making discs from some of the tape recordings and in handling their distribution and sale.

The commercial recording of African music, which is now a considerable business, appears to have begun in this way, and there is little doubt that a market for recordings of Pacific islands music can be developed, both among the islanders themselves and Europeans in the territories.

In order to get some idea of the demand for such recordings, and also in response to a request from the Western Pacific High Commission, the Commission recently made two discs of Solomon Islands music from some tape recordings contributed to the clearing-house by Mr. N. K. Wallis of Sydney. A small number of these discs has been sent to Honiara for sale through the B.S.I. Trading Corporation, and it will be interesting to see whether they prove popular with islanders and Europeans in the territory. They have already been welcomed by the officers concerned with broadcasting in the Solomons, and they were certainly enjoyed by a Solomon islander, Nelson Niolo, who visited the Commission's Sydney office on his way back to Honiara from the Fisheries Training Course in Noumea.

Nelson Niolo also listened to a selection of other recordings (on disc and tape) from the clearing-house. It was interesting to find that he liked any songs from other parts of the Pacific which were tuneful and attractive, even though he did not understand the language. If this attitude is common to all island listeners, the clearing-house service will enable any territorial radio station to broadcast programmes of music from other parts of the Pacific, and will thus be an important means of bringing the peoples of the Pacific closer together and of increasing their knowledge of each other's culture.

Catalogue Supplements To Be Issued

From the beginning of the clearing-house service, the Commission has kept in close touch with the Australian Broadcasting Commission, which already has a number of Pacific islands recordings, mainly from Papua-New Guinea. A supplement to the first catalogue of recordings in the clearing-house, which will be issued in the second half of this year, will include details of about 20 discs recorded by the A.B.C., some of which are already on sale to the public. These discs will be available only from the A.B.C., but the Commission is anxious to assist the A.B.C. in making them more widely known. Another large collection of discs of Papua-New Guinea music is now being prepared by the A.B.C. from tape recordings made in the area, and when it is completed details will be circulated to users of the clearing-house service. Additional contributions of recordings from the territories will also be listed as they come to hand in the first and subsequent supplements to the catalogue.

It is still too early to say how successful the clearing-house service will be, because much depends on the co-operation of the island broadcasting stations, both in contributing new recordings and in making use of the recordings already listed in our catalogue. The chief purpose of the service, to increase the amount of Pacific material available for island broadcasting, has already been realised to some extent, and it is hoped that in time the service will also encourage research in Pacific music and attract the interest of commercial recording companies.

Tuberculosis Control On Guam

(Continued from page 40)

trict nurse whenever a baby is born in the district and the nurse will perform the B.C.G. vaccination. It is also the duty of the district nurse to perform the tuberculin tests 8 weeks after birth on the babies discharged from the hospital as well as on the babies born in her district.

Re 2—School Children: One specially-trained Public Health nurse has been assigned to test and vaccinate all the 15,000 school children on the island, starting with the first graders. Before the schools were closed for summer holidays in 1956 she succeeded in testing and vaccinating 93% of all the first graders in the schools all over the island. The 7% not tested or vaccinated were either absent or their parents did not give the requested written permission.

Of the more than 1,200 children tested, 13% showed positive tuberculin reaction. These 13% did all have a chest X-ray and all contacts of these children were advised to have a tuberculin test and a chest X-ray in order to find the source of the tuberculosis infestation.

In this way our B.C.G. vaccination programme has proved to be a most valuable source of case finding and has in a most encouraging way stimulated the interest and the knowledge of tuberculosis problems in the parents.

Re 3—All Contacts of TB Patients: In order to minimize the risk of spreading tuberculosis through discharged tuberculosis patients, a close co-operation between the Tuberculosis Hospital and the Tuberculosis Control Unit of the Public Health Department is effected. Before the discharge of a TB patient from the hospital, the TB control nurse will be advised. She will pay a visit to the patient's home, check the economic and sanitary conditions of the family and the patient will not be discharged before all contacts have been examined, tuberculin tested, X-rayed and before all tuberculin negative contacts have had their B.C.G. vaccination and have turned tuberculin positive.

It is our experience that this plan has strengthened our TB control programme considerably. Not only do we find 40 per cent. of our new cases among the contacts of known tuberculosis patients, but through the education and the interest that the whole family of the TB patient is taking in this programme, it is much easier now to persuade the patient to follow his chest clinics and routine chest X-rays and thus in time find recidivists and have the patients re-admitted to the TB hospital when necessary.

Re 4—Other Groups Especially Exposed: More than 80% of the hospital personnel, Public Health personnel and the teachers so far examined were tuberculin positive. However, a few tuberculin negative cases were found among the personnel working in the TB hospital or in other ways in close contact with patients suffering from active pulmonary tuberculosis. These cases were all given B.C.G. vaccination and removed from their jobs until turned tuberculin positive.

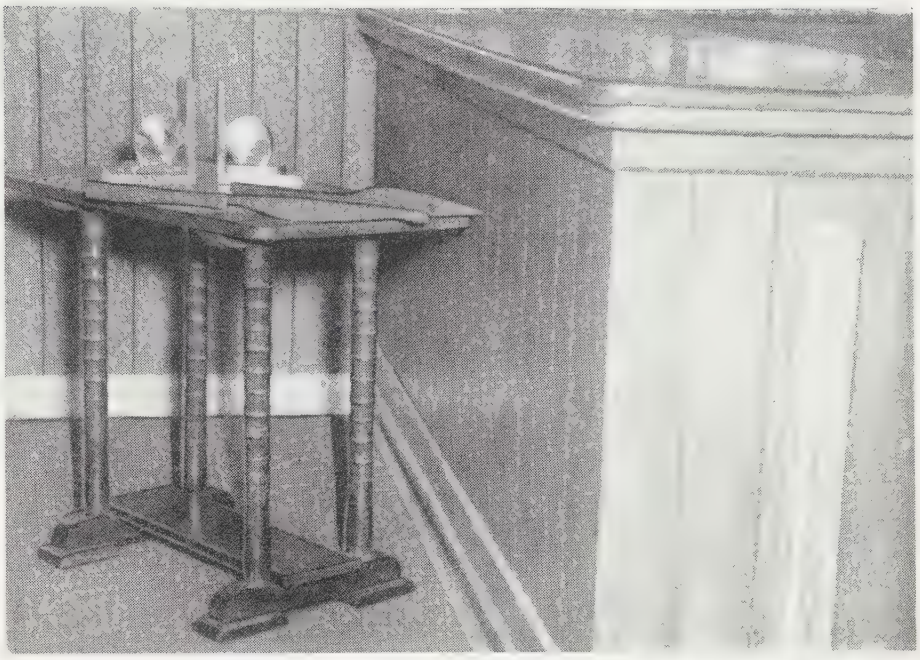
It is evident that no person should ever be allowed to work in close contact with active tuberculosis before having acquired either a natural resistance or having been immunized against tuberculosis—that is, in both cases before a tuberculin test has proved positive.

(Continued on page 46)

Practical Uses For Coconut Timber

Properly worked, coconut timber has many practical uses. The author has found it excellent for such varied purposes as making furniture, handcraft articles, rafters for thatched houses, room panelling, oars, barrels and feeding troughs.

By RONALD POWELL*



The table, ceremonial paddles, book-ends mounted with pearl shell, bench and wall panelling in this photograph were all made by the author from coconut timber.

ON some Pacific islands coconut timber has been used for many purposes for centuries. On others, people seem to be unaware that it is a very useful timber. Admittedly it is not very durable when left exposed to wind and rain. For example, it quickly rots if used for fence posts, while even as supports for a house it generally decays at ground level. Nevertheless, for certain applications it makes an excellent timber.

A word of warning first. Very old coconut trees are generally so hard that they are difficult to cut through with an axe. Once they are seasoned they are practically impossible to cut with standard wood-working power tools.

The day they are felled, however, they are not difficult to rip through with a pit saw or with any saw which strikes the grain in ripping, as a hand saw does. Coconut is not economical timber to cut with a standard circular saw; the only type which seems to be successful is that with steelite welded to the teeth.

The coconut palm does not grow like most mill timber, with the heartwood inside and the soft sap outside; it reverses the process. The saw-miller must realize this or the timber will be wasted. Once felled, the seemingly straight, graceful palm appears to have curves and twists which were not very apparent when it was standing. A good tree will sometimes cut three reasonably straight ten-foot logs (unless the logs *are* reasonably straight, the sawn timber is of little use).

Boards cut from the butt of a tree which is seventy or more years old have a very attractive appearance, with a mottled pattern in the grain, and make excellent furniture. They must be dressed to approximate sizes while still wet, however, for once dried and seasoned they are almost impossible to saw or plane.

All island timbers are of course better if seasoned under a thatched roof, and if boards are carefully dried after sawing they will remain stable. Timber dried under an iron roof in the tropics generally twists and checks until it is beyond any recoverable value.

With the hard bark stripped, the log must be turned to the best advantage and the saw cuts made which utilize the outer two or three inches of the trunk. Sawn timber will then have three good faces and one corner which is chamfered along most of its length. This cannot be avoided if the best timber is required from a slightly curved log.

A very old, hard tree can be used for sawing into boards for the first ten feet, but boards cut from timber above this height will always have two hard edges with a soft centre. It is better to cut the logs from the upper part of the tree into 2″ x 3″ and 2″ x 4″ sizes, generally leaving an uneven chamfer on one corner (the heart of the tree is generally too soft to use for any kind of construction).

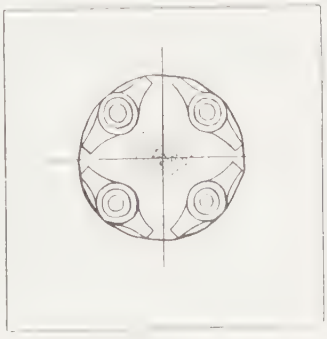
Cutting timber to these sizes leaves four small pieces roughly 2″ x 2″, which make excellent rafters for small thatched buildings where they remain as a permanent framework which can be thatched repeatedly. It is very durable, but requires boring before nails can be driven into it, which is a disadvantage where an electric hand-drill is not available.

If the right log is chosen, coconut timber makes excellent boat oars. Here, experience is necessary to pick the right tree. An old, hard tree makes oars which are virtually unbreakable. They are, however, stiff, and unless made fast by a lanyard they sink when dropped overboard.

A log a little softer than this makes oars that will float. Furthermore, they have a good spring to them, and

Left: This cross-sectional sketch illustrates the author's method of sawing into timber, the upper part of a coconut log (i.e. above the first ten feet).

Right: This sketch shows how the author, by quartering a log, cuts four oars from it.



* Marine Division, Department of Agriculture, Cook Islands Administration.

altogether compare favourably with oars made from ash or fir.

The timber at this stage is generally only sound for about 3" into the log, so there is a natural limit to the length which a coconut oar can be made to avoid the soft interior wood.

The rough sketches explain the most economical way to cut the timber. By quartering, the maximum width is saved and most of the tapering is done on the inside of the section. These oars are quite easy to cut out and shape on the day that the tree is felled. The final sanding and cleaning can of course be done when the oars are dry; this will not present much difficulty.

The bark of the growing tree gives a good indication of the timber inside. Where the bark is flint hard and flies off the axe in irregular flakes, the timber is naturally the hardest, while at the other extreme the bark is soft and can be stripped off in sheets. This timber is quite useless for any kind of work, but, between the two extremes, timber can be picked for a variety of jobs.

Barrels can be made from the sawn timber which are quite suitable for salting fish. While coconut is not a first-class barrel-making timber, where the latter is unavailable or is prohibitively expensive to import, it makes a valuable substitute.

There are innumerable items which can be made from coconut logs such as portable pig pens which are easily held together by notching the corners. (These, of course, are not to be recommended if rhinoceros beetle is present.) A simple and easily-made feeding trough can be dug out from a split log, leaving enough timber in the ends to hold water.

A Village School

(Continued from page 33)

be reduced if used in a way other than the traditional in all its details. Conversely, the use of certain treatments or new methods—for instance timber or thatch preservatives—may benefit local materials.

As an example of these ideas the illustrations show a design for a small village school: in this simple shelter the building elements are kept to a minimum consistent with providing suitable conditions.

A concrete slab is laid on the ground; at each end a triangulated tubular steel frame is erected and fixed to the slab; between the frames is hung steel reinforcing mesh; over this is fixed the aluminium roof, formed of long sheets running right across the building. To prevent lifting in high winds, cables are fixed under the roof, between end frames, in reverse curve to the roof, and attached to the mesh. Such a structure would not be affected by termites or wood borers, should require little maintenance, and have a long life. It is all easily handled and assembled—and as easily removed—and would pack closely for shipping. The materials are at present available in Australia.

Side view of the school, showing chalkboards mounted on the end frames.

Continual Internal Shade

The climate is assumed to be hot and humid. Placing the building with the long axis East-West provides continual internal shade. The low morning and evening sun can be excluded by using end screens of local matting, split bamboo blinds, or similar material. The long sides would normally be open, allowing full natural ventilation, since in such a climate evaporation of perspiration is often the main factor in maintaining bodily comfort. The need for such ventilation, and the incidence of a prevailing breeze, could affect the orientation of the building.

In rain or strong winds the sides could be screened with matting. By giving the roof a slight cross-camber heavy rain would run off quickly and so avoid building up any depth of water.

The bright finish of the aluminium surface, by reflecting the sun's radiant heat, would assist considerably in maintaining comfortable conditions; the concrete ground slab would also help since the earth temperature remains more constant than that of the air.

The chalkboards, supported on the steel framing at the East and West ends would be placed at a height suitable both for pupils' vision and also for writing: if tilted, they would make it easier for the teacher to write. The background of the end screens provides a suitable brightness graduation between the relatively dark chalkboard and the bright exterior, thus avoiding the problem of dazzle and glare. If ever required, waterproof storage may be fixed in the end frames, with the chalkboards as sliding doors.

Although in this case a very simple example has been given to illustrate the problems of human needs and climate, such an approach, although probably more complex in detail, is equally valid, and indeed necessary, for all buildings.

Balance of Trade for French Oceania

The balance of trade for French Oceania shows a deficit of 17,800,000 francs over 1956. Imports and exports for 1955 and 1956 were:

	In Short Tons		In Million Francs CFP	
	1955	1956	1955	1956
Imports	46,643	42,873	701.3	676.3
Exports	250,696	287,592	618.6	658.5

The balance shows a marked improvement as the 1956 deficit is much smaller than that of 1955, and is actually even more favourable if one takes into account the fact that tourists spent about 40 million francs CFP in the territory during 1956.

Major increases in imported goods were:

CANNED MEAT

24 million francs against 9 million in 1955;

CANNED MILK

16.3 million francs against 8.8 million in 1955.

The export of phosphate increased from 226,000 tons in 1955 to 265,000 tons in 1956. The export of coffee increased from 176 tons in 1955 to 331 tons in 1956.

World Fish Catch Rises 40 Per Cent In Seven Years

The remarkable recovery made by the world's fishing industry since World War II is revealed by tables contained in the latest FAO YEARBOOK OF FISHERY STATISTICS, *reviewed below.*

Fijian girls who have just taken part in a traditional fish drive, with some of the catch. A main activity of FAO's Fisheries Division is to encourage, wherever possible, increased fish production through the use of modern fishing techniques and equipment.

THE world catch of fish has risen by more than 40 per cent. since 1948, from about 19,400,000 to about 27,700,000 metric tons in 1955, according to the *FAO Yearbook of Fishery Statistics* (Vol. V, Production and Fishing Craft), recently published by the Food and Agriculture Organization (FAO), Rome. The catch is almost 40 per cent. higher than it was before the 1939-45 war.

This latest edition of the *FAO Yearbook* includes statistics from more than 150 countries and territories, given in 72 tables and, for the first time, important summary data are shown in diagrammatic form. Detailed tables are given for 73 selected countries which land about 75 per cent. of the world catch.

Data available from U.S.S.R. are given, broken down by species and administrative units. If the Soviet Union is added to the 73 selected countries, the details cover about 84 per cent. of the world catch.

The tables reflect the remarkable recovery of the world's fishing industry since the war, with Japan firmly in the lead of fishing nations. In 1948 the Japanese fishing fleet landed about 2,430,000 metric tons. By 1955 the figure had risen to 4,720,000 metric tons, some 2,000,000 tons more than the second biggest fishing nation, the United States which, including Alaska, landed 2,687,000 metric tons in 1955. U.S.S.R., with an officially published 2,500,000 metric tons (excluding aquatic mammals) is the world's third largest fish producer.

According to the *FAO Yearbook*, quoting statistics published in China (mainland), that country is the fourth biggest fishing nation, with an estimated 2,000,000 metric tons in 1955. Other fishing nations catching more than 1,000,000 metric tons annually are Norway (1,867,000) and the United Kingdom (1,099,700).

A considerable part of the increased fish production is being used for reduction to fish meal and solubles. This is indicated in the statistics which show in 1938 some 656,000 metric tons were used for reduction purposes. Since 1948, the tonnage has increased yearly and by 1955 had reached 1,164,000 metric tons.

Outstanding increases in fish production are recorded in the *FAO Yearbook* for Africa, Asia and South America, as well as for Europe. Taking 1948 = 100, the total African catch rose from 63 in 1938 to 231 in 1955—in tonnage from 440,000 to 1,620,000. Angola, for example, increased its catch from 26,200 metric tons in 1938 to 290,000 metric tons in 1955. Over the same period South West Africa (including the Walvis Bay area) shows an even greater increase, from 4,000 to 240,000 metric tons, while figures for the Union of South Africa rose from 63,900 to 357,700 metric tons. The expansion in southern Africa reflects the post-war development there of canneries and fish meal plants.

Comparative figures for the continents and regions are shown in Table 1.

Some interesting increases have taken place in South America, particularly in Chile and Peru, as the following figures (in metric tons) for 1938 and 1955 show: Chile from 32,200 to 214,200 and Peru from 35,900 (1948) to 170,000. Other increases in fish production in South American countries are: Argentina from 55,300 to 78,900; Brazil from 103,000 to 172,000 (1954) and Ecuador from 1,800 to 15,000.

TABLE 1

	1938	1955	PERCENTAGE INCREASE
Africa	440,000	1,620,000	168
America, North	3,150,000	3,800,000	18
America, South	230,000	760,000	124
Asia	9,350,000	11,280,000	27
Europe	5,540,000	7,650,000	35
Oceania	80,000	110,000	33
U.S.S.R.	1,520,000	2,500,000	66

TABLE 2

	1938	1948	1955
Belgium	42,900	70,800	80,000
Denmark (excluding Greenland)	97,100	225,900	425,300
Faroe Islands	63,000	92,300	105,600
Greece	25,000	33,600	60,000
Iceland	274,300	478,100	480,300
Italy	181,200	156,600	217,900
Netherlands	256,200	294,100	319,500
Norway	1,152,500	1,504,000	1,867,700
Portugal	240,000	274,500	390,600
Spain	408,500	547,200	762,800
Sweden	129,200	193,900	200,000

According to the available statistics, the *Yearbook* records the following figures for some Asian countries: India, 744,00 metric tons (1952) and 839,000 (1955); Indonesia, 472,000 metric tons in 1938 (for the territories of the Netherlands East Indies) and 651,500 in 1955 (for the Republic of Indonesia); Pakistan, 243,000 (1952) and 270,900 metric tons (1955). The figures for Thailand are 161,000 (1938) and 213,000 (1955), and those for Turkey over the same period are 76,000 and 111,500 metric tons.

There has been a particularly striking increase in the fish catch of the Philippines, from 80,900 in 1938 to 385,300 metric tons in 1955. These figures exclude molluscs used for duck feed.

Table 2 shows increases made in Europe by the countries listed.

There is little change in the catch of France and the United Kingdom. France caught 530,000 metric tons in 1938, as compared with 522,700 in 1955, and the United Kingdom 1,197,800 as compared with 1,099,700 metric tons in the same years.

West Germany provides interesting comparative figures. In 1938 Germany (including East Germany and other areas of prewar Germany) caught 776,500. In 1955 West Germany alone caught 776,900 metric tons.

Both Australia and New Zealand have increased their fish production, Australia from 33,500 (1938) to 52,100 (1955), and New Zealand from 27,000 to 39,200 metric tons over the same period.

Fish production in the U.S.S.R. has risen from 1,520,000 (1938) to 2,500,000 metric tons (1955).

Among the many interesting tables in the new *FAO Yearbook* is one which gives the world catch by groups of species in 1954. This table shows that herrings, sardines, anchovies, menhaden, etc., make up the largest group, yielding 7,000,000 metric tons a year or 27 per cent. of the grand total of 26,600,000 metric tons, live weight, while the group made up of cods, hakes, haddocks, etc., yields 4,200,000 or 16 per cent. Freshwater fish account for 2,600,000 metric 2,500,000 (9 per cent.). Tunas, bonitos tons (10 per cent.) and molluscs for and mackerels account for 1,700,000 metric tons (6 per cent.).

The waters of the northern hemisphere temperate zone and Arctic are the most productive, yielding 18,700,000 metric tons live weight, or about 70 per cent. of the world total. The tropical zones account for 4,100,000 (16 per cent.) and the southern hemisphere temperate zone for 1,400,000 metric tons (5 per cent.).

The *FAO Yearbook* is arranged in eight sections, A to H. The first four give details of catch and landings. Section E gives disposition of the catch and F shows production of preserved and processed commodities. Section G deals with fishing craft and section H with the whale catch.

Notes and glossaries of English, French and scientific names of fish provide interesting and valuable background and explanatory information.

This latest edition of the *FAO Yearbook of Fishery Statistics* (Vol. V, Production and Fishing Craft) has been enlarged and contains more detailed information than was found in previous issues. The text throughout is printed in English and French, with the Introduction, Notes and Section titles also given in Spanish.

There are five new tables of statistics in this edition of the *Yearbook*. The first, A-5, shows the world catch and landings by countries arranged by regions, thus providing comparable figures for the regions. B-2, which gives catch and landings in quantities by groups of species and by countries, is also a new table. So is F-1, a summary of production of preserved and processed commodities in selected countries. The two other new tables, H-1 and 2, provide statistics of the catch of whales by whaling areas, and by countries and whaling areas.

As the foreword states, the inclusion of more information "has been made possible partly by improvements in the basic data obtained, including previously unavailable official or semi-official figures for some countries, and partly by a more extended use of estimates in the calculation of totals".

The *Yearbook* is available from all FAO sales agents throughout the world, price $3 or 15/- or the equivalent in any national currency.

Tuberculosis Control On Guam

(Continued from page 42)

Education Of Public Important

Much stress has been put upon informing and educating the Guamanian population about this tuberculosis control programme.

Articles in the newspapers in English as well as in the Chamorro language, announcements in the radio, B.C.G. film shown in television and talks and movies about tuberculosis in village meetings and Parent Teacher Association meetings, have helped in disseminating knowledge and stimulating the interest in tuberculosis problems.

The Public Health Department, jointly sponsored by the TB and Health Association of Guam, has started a new quarterly health bulletin called *Salud* (the word used by the Guamanians for "Health"). The first number of *Salud* was dedicated to tuberculosis problems of Guam and 15,000 copies were distributed to all Guamanian school children.

Complete Control Expected

Our expectations are high of having completely controlled tuberculosis on Guam within a limited number of years. Time alone will prove if our hopes can be realized, but our experience so far has shown us that the introduction of a well-planned B.C.G. vaccination programme beyond its own merits also has helped us in stimulating the interest for tuberculosis in the population, helped us in finding new cases of tuberculosis and strengthened our control programme.

The TB & Health Association is jointly sponsoring the whole programme, so that all examinations, including tuberculin tests and chest X-rays and vaccinations, can be offered to the population without any charge. Fortunately, as another proof of the fine reception afforded this programme by the people, the Christmas Seal campaign of 1956 was a greater success than ever before, and will thus make it possible for us to continue our efforts in 1957.

Medical and Veterinary Entomological Surveys

The Medical Association of New Caledonia has just devoted a special issue of its *Bulletin* to the paper presented by Mr. Rageau, medical and veterinary entomologist of the French Institute of Oceania, at the Association's meeting on 1st March 1956. A brief review of the surveys was published in the *Quarterly Bulletin*, Volume IV, No. 2, April 1956. Those interested in this subject can now read Mr. Rageau's publications in full detail.

Above: At a general meeting of members of the Ngatangiia Co-operative Thrift and Credit Society, the Secretary reads the minutes of the previous meeting. On his right is the Co-operatives Officer, who guides the Society. He often acts as interpreter for the benefit of English-speaking visitors. Right: Here the Treasurer is receiving the monthly deposits collected from members by the Secretary

A Cook Islands Co-operative

This is a brief history of the Ngatangiia Co-operative Thrift and Credit Society, Limited—brief, because the Society is still a young one, for it was not formed until 26 July 1955, a few weeks after the arrival of the first Registrar of Co-operative Societies in the Cook Islands.

By J. L. NOAKES*

NGATANGIIA is a small Maori village in the island of Rarotonga, in the Cook Group. It is about six miles from the main centre and port of Avarua. It has a total population of about 565 Christian (mainly L.M.S.) Maoris living in some 83 houses. The village is on the coast but the land of the villagers extends into the hills inland. It has one primary school, a community centre, a cinema, one shop, a telephone along the main road joining it with Avarua and around the island, and a good water supply.

Practically all the inhabitants are connected in some way with agriculture, and grow their own kumara, taro, breadfruit, bananas and other tropical fruits and vegetables. Fish is scarce. They have coconuts for food and copra, and for other cash income from the soil they cultivate citrus fruit and tomatoes for export to New Zealand. Most families keep pigs, a few poultry and a horse. As the land is unfenced, these animals are a constant source of irritation to cultivators, and do much damage to crops.

The average income is very small, probably not more than £25 a year, although there are some—schoolteachers and other public servants—who receive considerably more. Compared with income, expenditure on Church festivals and the like is lavish. The value of money is not appreciated in the European sense, and certainly it has not been employed as a means towards better living.

It is significant that in the past the people of Ngatangiia led others in practical community development activities. Other villages have produced greater individualists but have not excelled the Ngatangiia standard of community cohesion. This does not mean that Ngatangiia can boast a higher standard of living or culture: it *does* mean that the community spirit of other days has not been allowed to die, and the will to work together for the common good, though possibly now only latent, is there to be revived.

The adjoining village of Titikaveka exhibits similar characteristics, but elsewhere on the island collapse of the community spirit is more complete. It was natural, therefore, that the principles of co-operation should make an earlier appeal to the people of Titikaveka and Ngatangiia than elsewhere.

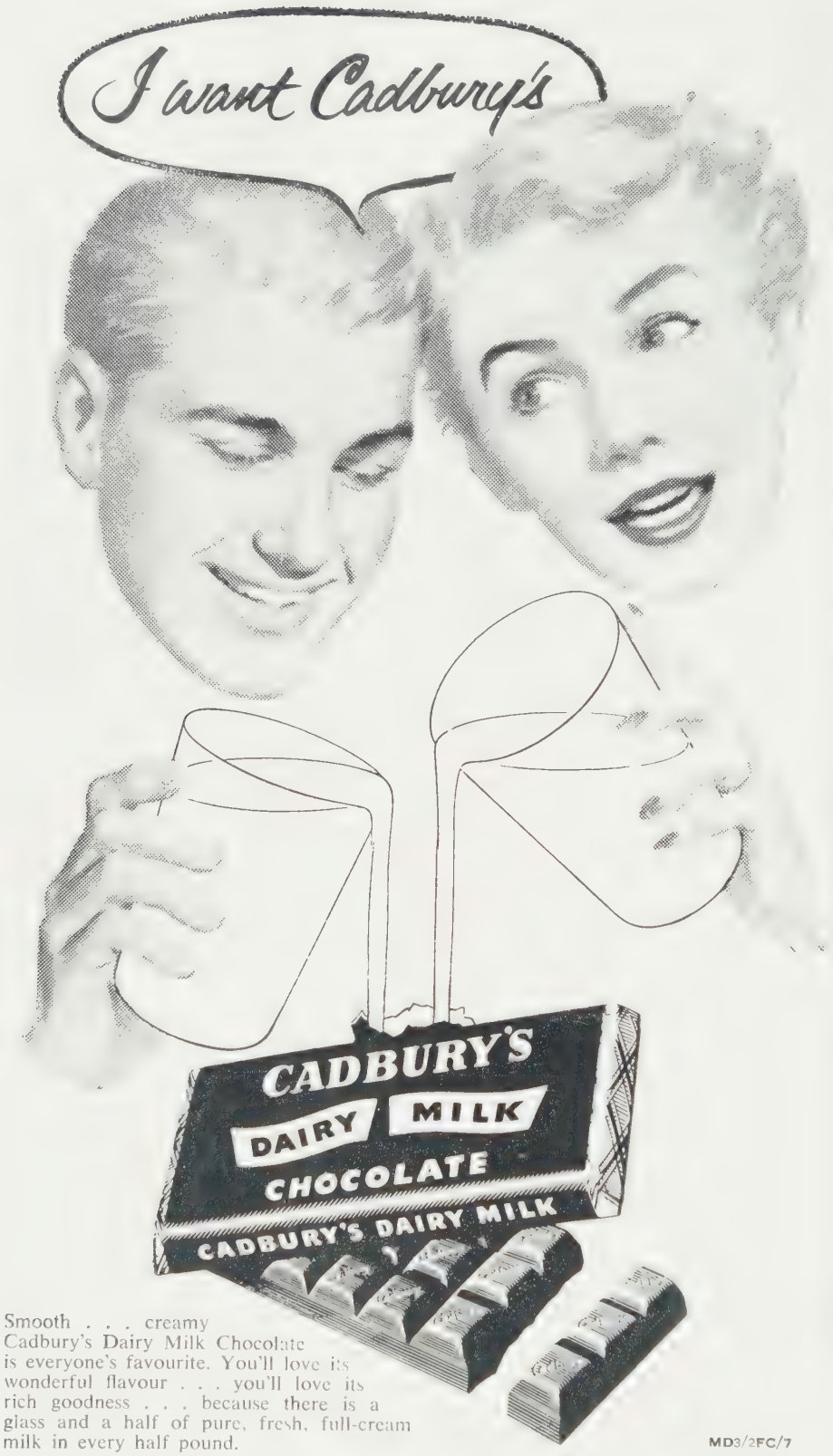
On June 13, 1955, the Registrar of Co-operative Societies was asked to speak on co-operation at the Ngatangiia Community Centre. Such was the interest aroused that, within six weeks, eight meetings had been held and a group of 31 men and women had applied for and obtained registration of the second co-operative ever to be registered in the Cook Islands. It may seem that registration was unduly hastened, but the earnestness of the members, the diligence of the office-bearers in their studies and the need for an example brooked no delay.

Type Of Co-operative Adopted

First, it is as well to describe the type of co-operative adopted by Ngatangiia. It was designed by the Registrar to meet their primary needs, but it was the people themselves who adjusted the design and made the final decisions on the form of the constitution of the Society.

The basic essentials to progress are knowledge and money. That they must be sought, obtained and put to use is a

* Registrar of Co-operative Societies, Rarotonga.



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fact that is fully realized by a people whose will to overcome their weaknesses is strong; weaknesses such as exist where physical and intellectual poverty are present, where customs sometimes militate against progress, where the use and value of money are not fully understood, where indebtedness is widespread, where methods of agriculture are retrogressive, and where it is patently impossible for the community to withstand the effect of external destructive influences unless it accepts a new and modern pattern of community development.

A co-operative thrift and credit society provides the means to obtain both knowledge and money. Members join together to practise thrift by means of small monthly savings in the Society which, because the members have so agreed, are compulsory and cannot be withdrawn during a certain period fixed by themselves except if a member dies or leaves the Society. (For Ngatangiia the fixed period is five years.)

These deposits cannot be set off by a member against his debts to the Society (although the Society may restrain upon them) and they gradually provide increasing working capital. No share capital is collected, but since the savings cannot be withdrawn for a fixed period they are in effect capital subscriptions.

The capital is used (a) to provide loans to credit-worthy members for productive and specific purposes and (b) to purchase essential supplies in bulk for sale to members for cash. Bulk purchasing does *not* mean running a shop. Each bulk purchase should be for one or two lines of goods at a time, the amount each member is prepared to buy for cash having previously been ascertained so that the goods are sold very soon after arrival.

Thus the habit of thrift is acquired by means of regular saving, and the use and value of the accumulating money are learnt by careful lending for productive purposes, by regular repayment of loans and by the buying and selling of goods without much risk. And over and above all this is the knowledge gained in procedure, book-keeping, democratic government, leadership, the give and take of mutual aid, and the value of adherence to law.

Weekly And Monthly Meetings

After registration, the Ngatangiia Society settled down to sober progress. The Committee began to meet once a week and has never stopped doing so. At these meetings members firstly deal with the current business of the Society, and, secondly, discuss and debate matters of general co-operative interest.

Members also assemble regularly in general meeting once a month—sometimes more often if the business is important. At these monthly meetings the members pay their savings to the Sec-

retary and deal with any business referred to them by their Committee or brought up by any of their number.

So the Society proceeds—committee meetings once a week and general meetings once a month.

In September 1955 the Committee made a survey to decide if it was worth while establishing a co-operative bakery in the village and came to the conclusion that the village was served well enough for the time being. Then in October it was decided that funds were sufficient to enable bulk purchasing to be commenced, and so the first purchase—two cases of tinned meat—was made. The meat was sold to members at twopence below market price even though the Society withheld ten per cent. commission. From then onwards, bulk purchasing was carried out once or twice a month, the goods distributed including tinned meat, sugar, tobacco, roofing iron, wire-netting and soap.

At the end of 1955 this business enabled a bonus of 1/4d. in the £ to be returned to members for their purchases. It is interesting to note that most of the recipients of bonus elected to pay this money into their individual savings deposit accounts.

By November the Society had a number of matters on its hands. There was a proposal to build a co-operative fish pond, but this was shelved for the time being. Then it was decided to introduce rules for the control of extravagance, and after three months of deliberations members finally unanimously decided strictly to curtail expenditure on weddings and other feasts. It is believed that their united action in respect of other extravagances will also set an effective example.

On November 17, 1955, less than four months after registration, the Society issued its first loan to a member—to purchase manure and wire-netting costing £9/7/8. This loan (and others following) was repaid punctually by instalments. After one year of working (i.e., by July 26, 1956) the Society had granted 19 loans of a total value of £169; of these, 12 have been repaid in full and £49 still awaits repayment.

This branch of the Society's business is on the increase and is providing members with a really valuable source of short-term credit for useful purposes, mainly agricultural. The interest charged is 10 per cent. per annum, which, if it appears high to outsiders, is in the view of members very low in comparison with other sources of funds, and they are surprised that the use of £1 costs only 2d. a month.

The way in which money can be saved has also been a source of surprise to members. The minimum monthly saving or deposit fixed by them when the Society commenced was 4/-, but of course those who wished to save more could do so. Total savings within one year amounted to £139, which is a lot of money for

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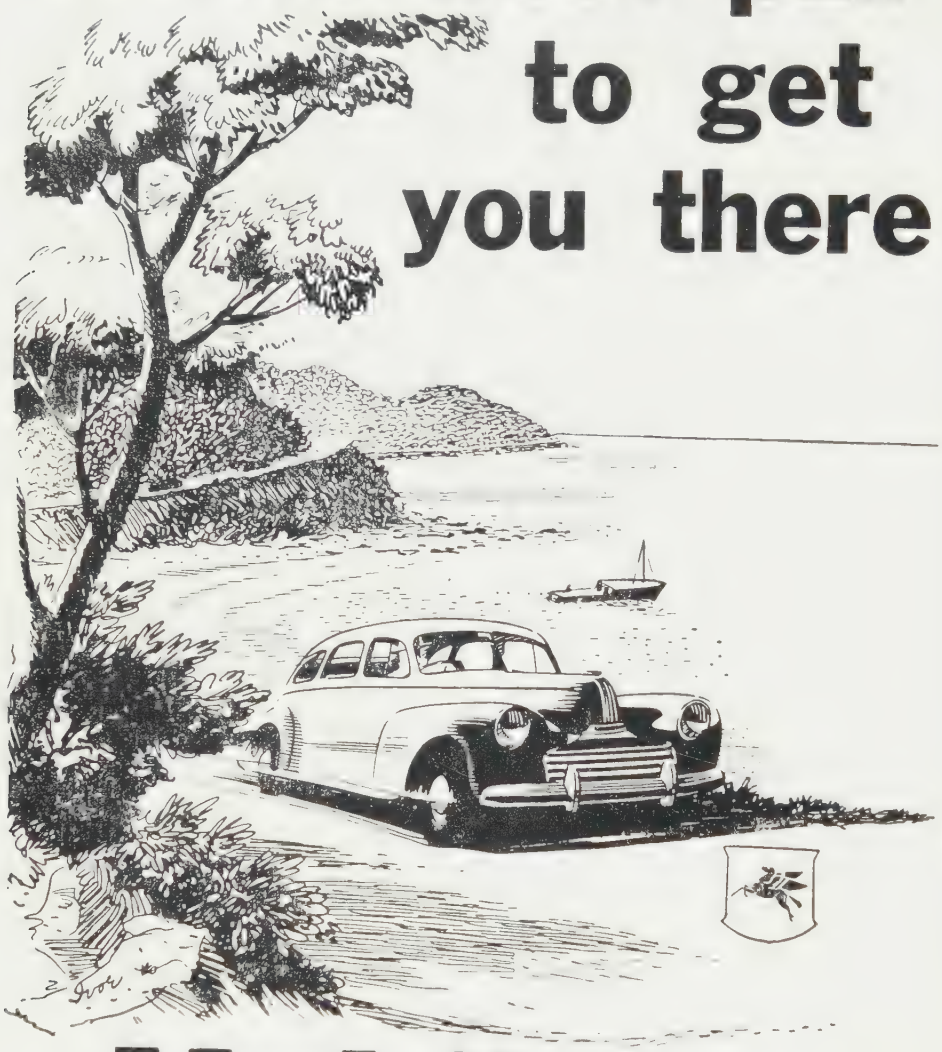

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people who see so little of it. Each member is really proud of his savings and the Pass Book which shows each deposit. About three members have caused some trouble by being late in their payments and two have been fined in accordance with the by-laws of the Society, but the others pay punctually at the end of each month. At present, no member is in arrears.

Although the Society is clearly on its way to achieving its primary objects the members have no intention of stopping at that. It has been noted that proposals for a co-operative bakery and fishpond were investigated and shelved, but towards the end of 1955 something else was also discussed, this time producing positive results. It was a proposal for a copra processing and marketing society.

Gradually plans were formulated, and in April 1956 those members who produced coconuts gathered about 4,000 and took them several miles to a drier owned by the Department of Agriculture. This was an experiment in the making of copra by a method new to Rarotonga, and although it was not wholly successful it provided the members with valuable experience and some money for share capital in the proposed new Society. They have now built their own drier in their village and the new Society is well on its way to formation.

Something else has also developed out of the first Village Society. There is a strong movement in the village to form a village council constituted on democratic lines to deal with the parochial affairs of the people, and the tribal leaders have freely offered abrogation of certain of their traditional powers in favour of the Council. It is too early to say if this new plan will be successful, but it can be said now that the old community spirit is awake once again; if properly directed we should see in Ngatangiia a form of local government likely to become a blueprint for all other villages in the Group.

Altogether, progress seems too good to be true, with development along classical lines and without any important interruption. Nevertheless it is not being achieved without hard work and sacrifice, and that of course is the reason for progress. Far too often in co-operation, as in other things, success is expected for little or nothing given in exchange; but the members of the Ngatangiia Society, now numbering about fifty instead of the original thirty-one, know that courage, determination and diligence are necessary for success.

PICTURE CREDITS

Acknowledgement is made for photographs reproduced in this issue as follows: Front cover, and page 18, 19, 20, 37, 41, Australian Official; 26, W. V. D. Pieris, with acknowledgement to Coconut Research Institute, Ceylon; 33, 44, Tony Moore, Sydney; 43, Ronald Powell, Rarotonga; 45, Fiji Official.

PACIFIC READING

Material in this section is contributed by the South Pacific Commission Literature Bureau. Any enquiries relating thereto should be directed to Box 5254, G.P.O., Sydney, Australia.

Notes and News

Papua and New Guinea in Pictures. This 96-page elementary social studies book has recently been published by Messrs. Macmillan & Co., Ltd., in association with the South Pacific Literature Bureau, at stg.4s. a copy. It has been written for the peoples of the territory in simple English by Mr. E. P. W. Marriott, who has been engaged for some years in educational work in Papua and New Guinea; there is a foreword by Mr. W. C. Groves, Director of Education in Papua and New Guinea. The extensive ground covered by this book is indicated by the chapter headings, which are: "Our Country and How People Live in It" ,"Different Kinds of Houses", "Our Old Customs", "What Europeans Have Brought", "New Kinds of Village Work", "The Health of the Country" and "Transport".

Each right-hand page carries a simply-written text in English, and facing it is an appropriate full-page photographic half-tone illustration (two typical specimen pages are shown in the illustration below, which is about half of the actual size of the book). We believe that the dearth of suitable social studies material with a Papuan and New Guinean background will make this book extremely popular.

Literature Bureau Publications. Several publications being produced by the Literature Bureau in co-operation with various territories and publishers are now nearing completion, and should become available within the next few months. Messrs. Macmillan & Co. are publishing *A Recipe Book for Pacific Islanders,* written by Lucy Hamilton, Dietitian, Department of Health in Papua and New Guinea. This book may be considered as a "follow-on" to the author's popular *Food and the Work It Does,* and should prove very useful in girls' schools and missions. Comprising some 160 pages, the book contains much practical information on various cooking methods, as well as over 500 tested recipes suitable for the islands peoples.

Another book being produced by the same firm is entitled *How the Crocodile Got His Teeth.* It has been written by G. N. Lansdown, who is well known for his series of animal stories, many of which have been produced mainly for African readers, and contains nine amusing animal stories with a Pacific Islands background. Written in simple English and illustrated with numerous black-and-white line drawings, these stories should prove suitable for either adult or school reading.

Another book expected within the next few months is *La Légende de la Terre,* by E. J. E. Lefort, Research Officer

(5) Gardening *(continued)*

The method of gardening on grasslands is a little different, because we must dig the soil to break up the grass roots. The people in the Highlands do this for their sweet-potato gardens. They live mostly on sweet potatoes. In other places bananas or yams are the chief food. The bananas are cooked while they are still green. Yams will keep well for several months if they are stored carefully in a dry place. The house in this picture (which is the picture on our $7\frac{1}{2}d.$ stamp) is a Trobriand Island yam house. The owner of the yam house likes everyone to see how much food he has, but he did not grow these yams himself. They are a present from his wife's brother. He gave his own yams to his sister's family.

Taro is the chief food of most people who live near the coast. It is the swollen root of a kind of lily. Young taro is growing in the garden on the hillside in the first picture. Taro needs rich soil cleared from the big bush, and with plenty of ash in it. In the old days we planted cockscombs among the taro to help the taro grow well. Cockscombs grow strongly and have a bushy red flower.

As well as our chief foods, we grow many kinds of vegetables in the garden. You will see taro, corn, bananas, pawpaws, sugar cane, and water melons all mixed together in a garden. Other vegetables are shallots, beans, tomatoes, pumpkins, and different sorts of cabbages.

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THE STAFF LIBRARY

Edited by C. R. V. BELL

This new series is planned to provide teachers with a small reference library. It will be welcomed by those in training, saving them much note-taking, as well as by qualified teachers, school managers and inspectors. The simple vocabulary and low price will bring it within reach of all concerned with teaching, and each book is provided with amusing illustrations.

London published price: each probably 2s. 6d.

Ready April

Teaching Lively English

by C. R. V. BELL

Some suggestions for enlivening the teaching of oral work, written work, reading, spelling and pronunciation, with helpful notes on the chief problems and difficulties which confront the Primary School teacher of English.

Examination Time

by C. R. V. BELL

The setting and marking of papers, the need for examinations, invigilating, and a brief note on the purpose of intelligence tests.

The English System of Education

by C. R. V. BELL

An explanation of the working of the English Local Education Authorities with notes on the application of the system to Africa. This book should be of interest to all concerned with education in the tropics.

Other titles planned include:

School Discipline
Visual Aids
Boarding Schools
Reading and Writing
Arithmetic

LONGMANS, GREEN AND CO. LTD.
6 & 7 Clifford Street, London W1

for Economic Development, South Pacific Commission. In the guise of an interesting little folk story, this book deals with the importance of soil care, and stresses the necessity for proper cultivation methods. The text is well illustrated with both two-colour and black-and-white line drawings. The initial printing is limited to a French edition.

Fish Preservation Booklet. Fish provides islanders with much of their protein needs, and, to prevent waste, it often becomes necessary to preserve part of a large catch for later use. To assist the islander in doing this the Literature Bureau is now preparing English and French versions of a small booklet detailing various methods of fish preservation. Entitled *Fish Preservation Simplified,* and written by the Commission's Fisheries officer, Mr. H. van Pel, this 24-page book describes some of the more common, but thoroughly practical and successful methods, of preserving fish. Topics covered include: wet and dry salting, sun drying, roasting and smoking, and cooking fish.

The text is simply written, well illustrated with two-colour line drawings and should be suitable for either adult reading or school use. Single inspection copies, together with details of production costs, will be available shortly from the South Pacific Literature Bureau, G.P.O. Box 5254, Sydney.

Health Leaflet in Colour. In co-operation with the Health Department of Netherlands New Guinea, a five-colour version (in Malay) of the illustrated health leaflet *Fruit Juice for Baby* (originally produced by the Bureau in English on behalf of the Health Department, Papua and New Guinea) is now in the course of preparation. The new text and illustrations have been adapted to suit local conditions and the addition of colour will, it is felt, considerably increase the attractiveness and usefulness of this leaflet. For technical and economy reasons the new leaflet is slightly smaller than the black-and-white English edition, being $9\frac{3}{4}''$ x $7\frac{3}{8}''$ in size.

It is expected that this leaflet will be completed in the very near future, and specimen copies with details of costs will be available free of charge to anyone who is interested. The Bureau will welcome enquiries from any territories requiring adapted versions of the health leaflets it has produced, or requiring assistance in the preparation of new material to suit their own needs.

Book List No. 17. Owing to absences on leave and duty of members of the staff of the Literature Bureau, and to the fact that for the last nine months they have been operating the audio-visual aids services in addition to their normal duties, it has not been possible for them to prepare the book reviews for Book List No. 17 for this issue. However, it is hoped that this list will be included in the next issue of the *Quarterly Bulletin.*

Collection And Preservation Of Island Manuscripts

The manuscripts listed below have been located and microfilmed by the Commission since the last Deposit Notice appeared in the *Quarterly Bulletin* for October 1955. Copies of each have been deposited in the appropriate library nominated by member governments, while other copies are available for purchase by research workers, librarians and others at the prices stated. (A full description of this Commission

service was published on p. 31 of the July 1954 *Quarterly Bulletin.*)

Deposit Notices Nos. 71-72

The following manuscripts have been made available for reproduction and deposit by Dr. Carl A. Schmitz of the University of Cologne and Dr. A. Capell, Department of Anthropology, University of Sydney. The originals remain in Dr. Schmitz' custody.

No. 71

KOLZKNECHT, K. A German-Azira (New Guinea) dictionary. 161 pp.

No. 72

KOLZKNECHT, K. An Azira (New Guinea), German and English dictionary. 160 pp.

Deposit Notice No. 73

The following manuscript was made available for reproduction and deposit by the author, who is Senior Geologist of the British Solomon Islands Protectorate, Honiara. The original remains in Mr. Grover's possession.

GROVER, J. C. Some aspects of mining development in the British Solomon Islands Protectorate. c. 1950. ii. 95 pp. appendices. illus. diagrs.

Deposit Notices Nos. 74-75

The following manuscripts were made available by Mr. J. D. Whitcombe, of Auckland, New Zealand. The originals remain in the author's possession.

No. 74

WHITCOMBE, J. D. "Tonga Tabu". A history and description of Tonga. c. 1918. 104 pp.

No. 75

WHITCOMBE, J. D. Grammar of the Tongan language. 1926. 76 pp.

Deposit Notices Nos. 76-77

The following manuscripts have been made available for reproduction and deposit by Rev. H. K. Bartlett, State Secretary, Methodist Overseas Mission, Adelaide, a former missionary in South-eastern Papua.

No. 76

BARTLETT, Rev. H. K. Legends collected at Misima and Panaeati, Papua. 64 pp.

No. 77

BARTLETT, Rev. H. K. Vocabulary of the Misima-Panaeati language, Papua. 155 pp.

Deposit Notice No. 78

The following manuscripts have been made available for reproduction and deposit by Mr. Gordon F. Larson, who is carrying out linguistic research in Netherlands New Guinea under the auspices of the Christian and Missionary Alliance. The originals remain in Mr. Larson's possession.

LARSON, Gordon F. and Mildred O. Moni Phonemes. i. 7 pp. A tentative statement on Moni Morphology. iii. 17 pp. Moni-Malay-English dictionary. 1956. ii. 45 pp.

Deposit Notice No. 79

The following manuscript has been made available for reproduction and deposit by the author, who was a Presbyterian missionary on Ambrym in the New Hebrides from 1933-48. The original remains in Rev. Paton's possession.

PATON, Rev. W. F. The language and life of Ambrym, an island in the New Hebrides. 1956. 513 pp.

How to Obtain Copies of the Above Items

Microfilm positives of the above listed items may be obtained at the following costs from the Executive Officer for Social Development, Box. 5254, G.P.O., Sydney, N.S.W.

No. 71	16/- (Aust.)	**No. 74**	6/6	**No. 77**	8/6
No. 72	15/-	**No. 75**	5/-	**No. 78**	6/6
No. 73	8/6	**No. 76**	3/6	**No. 79**	28/-

OXFORD ENGLISH COURSES

SUPPLEMENTARY READERS

If you are teaching from the *Oxford English Course for Papua and New Guinea, Fourth Book,* or from *Oxford English Books, Book Four,* you will be needing first readers, such as—

NINE FABLES	8d.
THE GOOD LITTLE MEN	8d.
ROBIN HOOD	8d.
CINDERELLA and RAPUNZEL	8d.
THE PRINCE WITH THE GOLDEN HAIR	8d.
SEVEN AFRICAN TALES	8d.
THE WOMAN AND HER SON	1/-
THE TORTOISE OF KOKA	8d.
THE ANIMALS' BAND	1/-
THE GOAT AND THE HYENA	8d.
TOM THUMB	8d.
THE KING WHO LOVED RIDDLES	8d.
TANGGA TALES	8d.
P'ING SHU THE STORY-TELLER	8d.
THE THREE WISHES AND OTHER STORIES	8d.

If you are teaching from the *Oxford English Course for Papua and New Guinea, Fifth Book,* or from *Oxford English Books, Book Five,* you will be looking for second readers such as—

STORIES FROM ENGLISH HISTORY	8d.
STORIES OF GREECE	8d.
THE KING OF THE GOLDEN RIVER	8d.
NEW TESTAMENT STORIES	8d.
STORIES OF ROME	8d.
RIP VAN WINKLE	8d.
PARABLE PLAYS	1/2
YOU WILL REMEMBER ME	1/2
GAZAN THE WARTHOG	1/2
THE ADVENTURES OF MR. RABBIT	1/-
MR. SPIDER AND HIS FRIENDS	8d.
GOGO GETS THERE	1/4

Fuller information, and details of the hundred other supplementary readers in the Oxford Progressive English scheme, can be found in the catalogue Oxford Books for Schools in the Pacific, which will be sent on request.

OXFORD UNIVERSITY PRESS

346 LITTLE COLLINS STREET, MELBOURNE

VISUAL AIDS

Films in the Commission library are marked with an asterisk before the title, and are available for viewing by any metropolitan or territorial government on application to the Executive Officer for Social Development, Box 5254, G.P.O., Sydney, N.S.W., Australia. Age classifications, where given, are intended as a guide rather than a recommendation.

Films

*BETTER POTTERY. 16 mm. 400 ft. Black and white. Sound. Colonial Film Unit.

The idea of this film is to show Africans that the making of pottery need not be confined to producing crude articles for domestic use, but that if care and taste are exercised it can be the means of building up a profitable industry. The work of a successful African potter is shown, with emphasis on his painstaking methods—his care in choosing the best clay, pounding and mixing, sieving, kneading and weighing, his constant supervision of his workmen and his attention to the smallest details. The potters are seen throwing the clay—using wheels—then the pots are dried, stacked in the kiln and baked and finally packed and sent away to other districts. The moral is that a good hard-working potter can not only make a comfortable living but can also bring employment and prosperity to others and satisfaction to those who use his goods.

*BLOSSOMS REVIVED. 16 mm. 15 min. Black and white. Sound. Produced by Ministry of Information and Broadcasting, India.

This interesting documentary film was produced in India and deals with the care and after-treatment of poliomyelitis victims. It tells the story of a young Indian girl suddenly stricken with polio, and describes how the ravages of this crippling disease were checked. After diagnosis the child is taken to a polio clinic, where with specialized care and physiotherapy and rehabilitation exercises, the wasting limb is gradually restored to normal use. The theme of the film is simple and clear—it stresses the importance of early diagnosis of the disease if a cure is to be effected and the urgent need for many more such clinics in India.

Photography is generally good, but at times the commentary is difficult to follow.

Filmstrips

AFRICAN LIFE IN THE COPPER BELT OF NORTH RHODESIA. Pt. 1. An African Village. Produced by Gaumont British, London. Black and white. 32 frames. Captions and subtitles. Teaching notes. Published price stg.15s.

Subject: Life in a Central African village.
Medium: Maps and photographs.
Technical Standard: Very good.
Comment: Good quality photographs show something of the everyday life and customs in a bush village located near a large copper mining town in Northern Rhodesia. The strip opens with two maps—one showing the location of Rhodesia within Africa and the other giving the position of the village concerned in Northern Rhodesia—and these are followed by aerial views showing the general layout and pattern of the village. Succeeding frames give a good idea of life in a village. There are scenes of: the interior of a house occupied by a family; preparing meals; bringing water from a spring; cultivating the land for various crops; making fish traps and going to market to sell surplus products.

The treatment of the subject is logical and well developed and the photography is of a high standard. Teachers of social studies in secondary schools should find this strip very useful as a typical example of village life in Central Africa.

AFRICAN LIFE IN THE COPPER BELT OF NORTH RHODESIA. Pt. 2. David, the African Miner and His Family. Produced by Gaumont British, London. Black and white. 24 frames. Captions and subtitles. Teaching notes. Published price stg.15s.

Subject: Life in an African mining town.
Medium: Maps, photographs and diagrams.
Technical Standard: Average—good.
Comment: This strip follows on from Part 1 reviewed above. It shows the changes in living standards that take place when an African miner and his family move from their bush village to the nearby mining town and the father becomes a copper miner. As in Part 1, two maps show the position of Rhodesia and the mining area within Africa, and the remainder of the strip is composed of photographs illustrating the mining town, the workers' compound, some mining operations, allocation of rations and family meals, children attending school, and finally the social activities of the adults.

The pictures are interesting and informative and supplemented by well-written teaching notes. Suitable for secondary schools.

AID TO SOUTH-EAST ASIA. Produced by Central Office of Information, H.M.S.O., London. Black and white. 32 frames. Teaching notes. Published price unknown.

Subject: Colombo Plan in action.
Medium: Photographs and maps.
Technical Standard: Average—good.
Comment: A brief summary of how the Colombo Plan is being used to raise the standards of living in S.E. Asia areas where conditions of poverty, malnutrition, meagre health services and poor educational facilities have retarded progress and full utilization of natural resources. Improvements envisaged under this plan include the training of technicians, better health and hygiene standards, provision of new homes, mechanization of farming practices, hydro-electric power stations, and irrigation schemes for increasing food production.

The illustrations are of good quality and the teaching notes adequate. Suitable for secondary schools.

BRITAIN AIDS COLONIAL PROGRESS. Produced by Central Office of Information, H.M.S.O., London. Black and white. 32 frames. Teaching notes. Published price unknown.

Subject: Aid to Colonies.
Medium: Photographs.
Technical Standard: Good.
Comment: A pictorial survey of post-war economic development and other projects undertaken by Great Britain under the Colonial Development Act in many colonial territories with the object of raising the living standards of the people. Subjects covered include: aerial surveying, research into malnutrition and health problems, control of plant diseases and pests, soil conservation, dam making and irrigation schemes, increased education facilities, and better transport and housing.

The technical quality of the photographs is good and the teaching notes fully explain the significance and contents of each frame.

BRITISH FORESTRY. (Rural Science Series). Part 2. Uses of Timber. Produced by Common Ground Ltd. Black and white. 34 frames. Teaching notes. Published price stg.15s.

Subject: Uses of British Timber.
Medium: Photographs.
Technical Standard: Good.
Comment: This strip is divided into three main

sections. The first part shows felling and hauling logs, squaring, cutting and stacking at the sawmill, and subsequent use of the finished timber for houses, boats and furniture. The second section shows the use of timber for pit props and poles, whilst the final frames describe some of the old handcrafts such as making hoops, baskets and brooms, and charcoal burning.

A well-produced strip, illustrated with good photographs and supplemented by interesting teaching notes.

FAT PIG. (Infant Reading Series). Produced by Common Ground Ltd., London. Black and white. 40 frames. No notes. Captions. Published price stg.15s.

Subject: Infant story.

Medium: Drawings.

Technical Standard: Average.

Comment: Intended as an infant teaching aid, this amusing strip relates the adventures and mishaps that befall a fat pig from the time he leaves his sty until he returns. The illustrations are simple black and white line drawings, and each has an appropriate sentence or phrase hand-lettered beneath it. Most young children will find this story both entertaining and amusing; the simple vocabulary used will make the strip readily understandable in the early years of an English Course.

L'AUTOMOBILE. (Série: Sciences Appliquées). Produced by Editions Nouvelles, Paris. Black and white. 39 frames. Teaching notes. Published price F. Met. Frs. 285.

Subject: Motor cars.

Medium: Drawings and photographs.

Technical Standard: Average.

Comment: This strip provides a simple introduction to the basic operation of the modern motor car. The first three frames depict three early model cars; these are followed by line drawings and photographs describing the various components of a modern car and their functions. Topics discussed include—the chassis, steering mechanism, springs, engine operation, the clutch, gears and gear changes, differential unit, brakes and the electrical system.

Illustrations are clearly drawn, with important points labelled and described in the accompanying notes. The teaching notes are brief and mainly intended as a guide to the teacher.

THE LITTLE BROWN BAT. (Canadian Animal Series). Unicorn Head Ltd. for National Film Board of Canada. Black and white. 25 frames. Teaching notes. Captions. Published price stg.12s.6d.

Subject: Life and habits of bats.

Medium: Drawings.

Technical Standard: Average—good.

Comment: Although a harmless night-flying creature, the bat has been the subject of many superstitions and misconceptions. Even today the bat is regarded as uncanny by many people who do not understand nature. But its apparently erratic and eerie flight is probably largely the reason for this superstition. The aim of this strip is to dispel some of the mysteries that surround this little mammal. Clear drawings with captions show many aspects of the bat's life including its sleeping habits, how it flies at night without hitting obstacles, hibernation, spring maternity colonies, and the training of infant bats.

The mimeographed notes briefly describe each frame and include interesting information on superstitions, etc., usually associated with bats.

POTTER. (Crafts and Craftsmen Series). Produced by Common Ground Ltd., London. Black and white. 41 frames. Teaching notes. Published price stg.16s.6d.

Subject: Making pottery ware.

Medium: Photographs.

Technical Standard: Very good.

Comment: Pottery is one of the oldest crafts practised by man. This strip depicts the work of the craftsman potter, as opposed to mass production methods, and clearly shows the methods used in making a decorated jug. Sequences described include: digging, washing and preparing the clay, turning the ball of clay on a potter's wheel, forming the lip and handle, decorating methods, glazing and firing in the kiln. The final sequences show the finished jugs being sorted before despatch.

The technical quality of this strip is very good and the photographs both clear and accurate. Handcraft teachers may find it useful as an introduction to pottery making.

THE STORY OF RADIO. Produced by Unicorn Head, London. Black and white. 35 frames. Teaching notes. Published price stg.10s.

Subject: Development of radio.

Medium: Drawings, diagrams and photographs.

Technical Standard: Very good.

Comment: The aim of this filmstrip is "to trace the history and development of radio and to explain in simple terms how a broadcast programme is transmitted and reproduced". The first half of the strip serves as an introduction to the subject, being devoted mainly to the description of early telegraph and telephone equipment and basic electrical

"How It Is Done" Series

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A new series of short, simply worded and clearly illustrated books of practical instruction. Each booklet explains basic principles and then shows how different models on the market today are used. Book I, *How to Look After Your Bicycle* (1s.); Book II, *How to Use Your Sewing Machine* (1s. 3d.); Book III, *How Your Camera Works* (1s.). Other titles are in preparation.

Readers and Stories to Remember

E. F. DODD

Two series with controlled vocabularies, specially prepared for pupils learning English as a second language. The *Readers* (from 9d. to 1s. 3d. each) are all illustrated original stories or adaptations, in grades, with vocabularies of 300 to 2,000 words. *Stories to Remember* (from 1s. 3d. to 3s. 3d. each) are simplified versions of classics, written in 2,000-word vocabularies. Prospectus available on application.

Things We All Remember

R. J. CANDY

Each book contains 15 two-page sections, which follow the course of well-known commodities from raw product to finished article. Lively diagrams face the text. Books I, II, III, 1s. 9d. each.

Macmillan & Co., Ltd.

St. Martin's Street, London, W.C.2

theory connected with transmitting. The remaining frames are concerned with the developments of wireless and topics dealt with include: the early experiments of Marconi; the operation of the valve as a detector and amplifier of radio signals; the modern system of broadcasting, with photographs of the studios and control desks; and finally there is a description and details of operations of a typical modern radio receiver. This is a comprehensive strip and gives ample scope for more than one lesson on the subject.

The material is well presented with clear photographs and drawings, and should be of interest to senior classes of secondary or technical schools.

Dairy Production In Tahiti *(Continued from page 36)*

In conclusion, emphasis should be laid on the prospects for stock-raising in Tahiti. Just as in former times the island was dependent on imported beef, whereas now it is able to live on its own resources, so the recent development of milk production, which was insignificant a few years ago, gives hope at the present time of a considerable reduction in imports of tinned milk.

This objective deserves a place in the front rank of present-day activities in view of the great social benefits to be achieved by the provision of sufficient supplies of fresh milk. No doubt public taste, unaccustomed in many cases to fresh milk, will require some modification, but this factor is not a major obstacle.

As far as the producer is concerned, the techniques of dairy production are rather complex. Problems encountered in breeding, individual pathology, and incorrect feeding automatically result in loss of profit. Apart from individual training of stock holders, technical assistance in the field of pathology and stock raising should also be undertaken as a necessary associated activity.

South Pacific Literature Bureau

The following books, which have been published by various publishers in association with the Literature Bureau, are available from booksellers.

PAPUA AND NEW GUINEA IN PICTURES. Published by Macmillan & Co. stg.4s.

HEROES FROM FIJI. R. S. Adam, published by Macmillan & Co. stg.2s.2d.

RICE. W. Cottrell Dormer, published by Longmans, Green & Co. stg.2s.6d.

PLAYS FOR YOUNG PEOPLE. Camilla Wedgwood, published by Longmans, Green & Co. A.2s.6d.

WEALTH FROM THE COCONUT. W. V. D. Pieris, published by Ure Smith Pty. Ltd. stg.2s.6d. (available in the following language editions: English, French, Fijian, Pidgin, Maori (Rarotongan), Samoan, Tongan, Malay).

FOOD AND THE WORK IT DOES. Lucy Hamilton, published by Macmillan & Co. A.3s.

THE HIRI. Camilla Wedgwood, published by Longmans, Green & Co. A.1s.6d.

ACROSS NEW GUINEA. Ivan Champion, published by Longmans, Green & Co. A.1s.6d.

THE MAGIC POT. Peter Livingston, published by J. B. Wolters & Co. stg.1s.3d.

NA DINAU SA DAU VAKAVUNA. (a Fijian edition of "Debts Make Difficulties"). Eunice Carpenter, published by Sheldon Press. stg.8d.

NA I VOSAVOSA VAKAVITI E SO. (Fijian idioms). Anare K. Raiwalui, published by Oxford University Press. A.4s.

MOTHERCRAFT BOOK. N. Stead, published by Longmans, Green & Co. A.5s.

PRINCIPAL COMMISSION PUBLICATIONS

- *SPC QUARTERLY BULLETIN:*
  Annual Subscription ..... *8/-Stg.*
- *TECHNICAL PAPERS:* These are technical reports on a wide range of subjects in the economic, social and health fields (list on back cover).
- *OFFICIAL RECORDS: Proceedings of Sessions of the South Pacific Commission* (First to Sixteenth); *Annual Reports of the South Pacific Commission* (1948 *to* 1955); *Reports on the First and Second South Pacific Conferences; Progress Reports on Action Taken on the Resolutions of the First and Second South Pacific Conferences.*
- *EXPERT REPORTS:* The Oxford University Press is publishing a series of Expert Reports in book form for the Commission. Four have been issued to date:

  VOCATIONAL TRAINING IN THE SOUTH PACIFIC. By R. A. Derrick, M.B.E., A.M.I.S.E., F.R.G.S. Mr. Derrick's report consists of a survey of the facilities for professional and technical training in the whole of the South Pacific, and of recommendations for future development.
  Price in Australia ..... *30/-A.*

  MOTURIKI: A PILOT PROJECT IN COMMUNITY DEVELOPMENT. By Howard Hayden. A fully documented, copiously illustrated report on a pilot project in community development carried out under Commission sponsorship on the island of Moturiki by the Government of Fiji.
  Price in Australia ..... *42/-A.*

  SOCIAL ANTHROPOLOGY IN MELANESIA: A Review of Research by Dr. A. P. Elkin, Professor of Anthropology in the University of Sydney. In this report Dr. Elkin reviews past, present and future anthropological research in Melanesia, designed to advance native welfare.
  Price in Australia ..... *27/6A.*

  SOCIAL ANTHROPOLOGY IN POLYNESIA: A Review of Research by Dr. Felix M. Keesing, Professor of Anthropology, Stanford University. This is a parallel study to Professor Elkin's report on anthropological research in Melanesia.
  Price in Australia ..... *27/6A.*
- *BIBLIOGRAPHY:* The following bibliography has been published for the Commission by Oxford University Press:

  A BIBLIOGRAPHY OF BIBLIOGRAPHIES OF THE SOUTH PACIFIC: Compiled by Miss Ida Leeson, former Mitchell Librarian. A basic catalogue arranged by area and subject.
  Price in Australia ..... *15/-A.*
- *OTHER PUBLICATIONS:*

  The Construction of Literacy Primers for Adults: By Dr. K. Neijs ..... *5/-Stg.*

  How to Make Your Own Filmstrips: By Nancy Phelan. *2/6Stg.*

The above volumes are obtainable through leading booksellers.

INQUIRIES REGARDING COMMISSION PUBLICATIONS MAY BE DIRECTED TO THE SECRETARY-GENERAL, SOUTH PACIFIC COMMISSION, NOUMEA, NEW CALEDONIA, OR TO G.P.O. BOX 5254, SYDNEY, AUSTRALIA.

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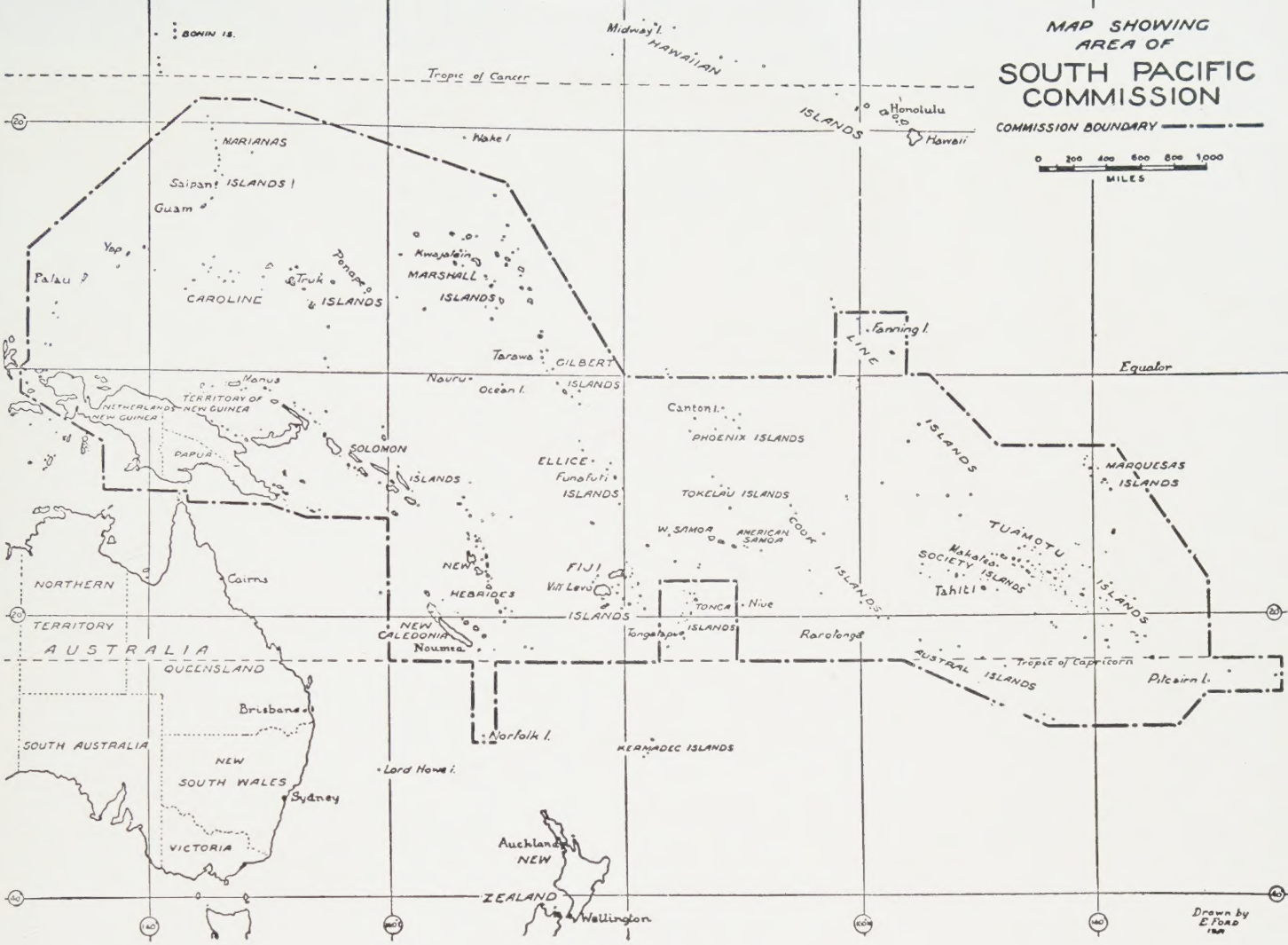

COMMUNITY DEVELOPMENT

2. **Community Development.** March 1950.
11. **Interim Reports on the Moturiki (Fiji) Community Development Project.** Howard Hayden, Director of Education, Fiji. May 1951.
26. **Further Education in the Cook Islands.** P. F. Henderson, Officer for Further Education, Cook Islands. July 1952.
35. **The Purari Delta—Background and Progress of Community Development.** November 1952.
45. **The Nimboran Community Development Project.** Dr. J. van Baal, Director of the Bureau of Native Affairs, Netherlands New Guinea. June 1953.
46. **The Koror Community Centre.** Reports supplied by the High Commissioner, Trust Territory of the Pacific Islands. August 1953.
74. **Educational Aspects of Community Development.** R. Thomson. January 1955. (4/-. stg.)
84. **The Communities Project Approach to Economic Development.** H. Belshaw. July 1955.

EDUCATION

3. **The Village Library.** April 1950.
4. **Visual Aids in Education in the South Pacific.** A. L. Moore, Visual Aids Consultant. April 1950.
13. **Vocational Training Facilities in Australia for Students from South Pacific Territories.** May 1951. (Out of print.)
14. **Educational Broadcasts to Samoan Village Schools.** Department of Education, Western Samoa. May 1951.
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